AVIATION

The Oldest American Aeronautical Magazine

OCTOBER 13, 1928 Issued Weekly PRICE 20 CENTS

The new Pratt and Whitney powered Boeing transport over San Francisco

VOLUME XXV

NUMBER 16

Special Features

The Cleveland Airport

Aviation Country Clubs

The Control of the Materials

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The Worthy Type

THERE is, perhaps, no other industry in the world that has been made possible by such belief in a cause, and by such personal sacrifice, as the aeronautical industry. From the very beginning, the pioneers of the air were considered little less than crazy fools by the rest of the world, and it is only of recent years that they who laughed and ridiculed have come to realize what the time, patience, suffering and unceasing efforts of those "crazy fools" gave to modern civilization. More than once it seemed as though there was nothing ahead for those pioneers—that to carry on was but a waste of time and the throwing away of the best years of their lives. Yet, that great and eternal something inside of them, which, for the want of a truly suitable name must go nameless, inspired them to carry on in what seemed certain to be hopeless defeat of purpose. Those pioneering efforts are now history. History that has been forgotten by some, and never even known by others.

The realization of dreams come true will never be felt by all of those "inspired ones" for many of them have passed on to the airman's Valhalla—heroes of yesterday who gave their all that aviation might take its rightful place in the industries of the world. To them aviation owes a debt which can never be paid in full. Merely paid in part by continuing with the task to which they devoted their lives.

Naturally, there are men in the industry today who were not among the pioneers. They are the newcomers to the fold, but many of them also possess that priceless quality—faith in the cause. They believe in the airplane as they believe in nothing else and are working toward the common goal. Of late, a man had his entire family taken away from him by an airplane accident, yet in his hour of almost overwhelming grief his one desire was to redouble his efforts to make the air safe for others. To that end he is now working. Aviation was given birth by that type of man. Aviation is today being developed by that type of man and, God willing, the destinies of aviation will always be in the hands of such men.

War Fliers as Salesmen

IN the past year, airplanes practically have sold themselves. The demand has been far greater than the supply. As a result, there has been no need for maintaining well formed sales organizations. However, the production of aircraft in the United States is increasing by leaps and bounds, and soon there will be real competition in selling. Taking two products of equal value, the one, which is offered to the public through the most efficient sales system, undoubtedly will show the best results in sales.

There is the problem, though, in establishing a sales organization, of obtaining competent salesmen. The man, who sells airplanes, should have a knowledge of flying as well as salesmanship. During the World War, thousands of fliers were trained, and many of them have gone into sales work. It would seem that these men offer a fertile field from which salesmen and distributors could be recruited.

Without question, a large number of them could be shown that the sales end of commercial aviation now offers unparalleled opportunities. Although these men would of necessity have to "brush up" on the recent commercial developments, their war experience in flying would stand them in good stead.

Legal Precedents

THE law is one thing and the interpretation of the law is another. As yet there are no special laws applying to all phases of aircraft operation, and in almost all cases, it is necessary to go to laws, which have baen drafted with a view to terrestrial affairs, and apply them to aerial operations. The judge who tries the case has, therefore, a double duty. He has to try to find out what law applies and then to interpret it. This is a difficult task and as a rule the judge will look up to see if there is any precedent in the case. If there is, the easiest matter is to follow the precedent. Once two or three cases have been decided in a similar way, a new interpretation, or the application of a law, becomes very difficult, and the precedent set by the original decision gains almost the force of a new law.

Many of the cases, which are being tried now, will set precedents that will last for many years. It is, therefore, highly important that the cases be correctly decided. Unfortunately, many of the cases, such as damage suits for accidents, are being tried in local courts where the judge is apt not to have had broad experience, and also, what is more important, the case is usually tried before a highly prejudiced jury. As a result, decisions, which might well be favorable to aircraft operators, have been adverse and precedents have been established which will do permanent injury.

At the present time, a damage suit arising from the operation of aircraft is a matter of national importance and should be so regarded, not only by the individual who is being sued, but by the whole aeronautical industry as well. The efforts of the Aeronautical Chamber of Commerce to find competent lawyers in various parts of the country who are conversant with aeronautical matters and who can handle cases with more authority than less experienced men are certainly efforts aimed in the right direction. There are many cases that should undoubtedly be appealed to the higher courts, which often would be beyond the means of some small local operator. In such cases, it would seem advisable for operators to pool together, and to employ the best possible talent in order to be sure that a correct precedent is established.

The Cleveland Airport

Continued Expansion and Improvement Since the Opening in 1925 Has Made the Field a Splendid Airport Model

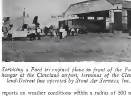
By WALTER E. BURTON

ITS rapid growth, since the opening July 1, 1925, has been an outstanding feature of the Cleveland Municipal Airport Today, it is considered one of the finest examples of a modern air terminal It is exerting an increasing influence upon transportation activities in Cleveland, and throughout northern Ohio

The airport is situated on Rocky River road, about six miles from the Cleveland public square When it was first opened, the ground area improved for use was approximately 400 x 2000 ft The average number of plane movement each month was 300, not including short passengers sight-seeing flights Today the improved field space measures 3500 ft on a side, and the plane movements are totaling 1,500 monthly

Eight large hangars, each capable of housing upwards of a dozen planes, are included among the airport buildings. Seven more hangars are to be erected this year, according to Maj John Berry, superintendent of the airport In addition, there is at present a small office building, which also houses a U. S Weather Bureau station The construction of a large administration building is planned in the near future

"We have what we consider the best branch of the weather bureau in existence for forecasting upper air conditions," Major Berry declared "It is possible for a pilot, day or night, to obtain, in a moment's time, accurate reports on weather conditions within a radius of 500 mi, of Cleveland"



Servicing a Ford tri-engined plane in front of the Ford hangar at the Cleveland airport, terminus of the Cleveland-Detroit line operated by Stout Air Services, Inc.

The weather station is in charge of W. E. Jakl Balloon soundings of the upper air currents are taken at periodic intervals throughout the day Other weather information is collected by direct observation, and by reports from other stations

Communication facilities at the airport, in addition to the usual telephone service, include telegraph lines and a radio station. A radio beacon, for the purpose of determining the position of planes in flight, is being installed

The Cleveland airport also boasts of one of the best lighting systems, and one of the most complete drainage systems of any field in its class. A four-foot brick sewer, 7,600 ft long, seven miles of 15 in pipe, and 250,000 ft of French drain pipe, insure a field free from mud holes and pools of water during all seasons of the year. The drainage system is being extended constantly

Maj John Berry, superintendent of the Cleveland Municipal Airport

The nucleus of the lighting system is a 500,000,000 candle power floodlight Besides this there is a 4,500 ampere, vari-colored beacon, a 5,000,000 candle power beacon, a ceiling light of the same power, and 60 boundary lights, each rated at 6 6 amperes, which outline the field

Among the airlines now operating from the Cleveland airport are the Stewart Aircraft Co , the Colonial Western Aircraft Co , Pittsburgh, Youngstown and Cleveland Air Mail Line, Continental Airways, United Air Lines, two lines of the National Air Transport, Inc., Stout Air Services, Inc.; Thompson Aeronautical Corp , Young and Smith Airways; Dungan Airways, Inc, and the Ohio Airways Co Most of these organizations maintain individual hangars In addition, several new companies soon are expected to begin operations, Major Berry said There is also a hangar of the Ohio National Guard Aero Squadron on the field, where a fleet of military planes is maintained

The Stout Air Services, Inc , a division of the Ford Motor Co, operates perhaps the largest planes using the field Regular service between Cleveland and Detroit is maintained with Ford three engined planes, carrying from six to 14 passengers The trip, one way, takes one hour and 40 min. A speed of about 100 m p.h is maintained The present rates for the trip are $18 one way, and $35 for the round trip Westbound planes leave Cleveland at

9 15 A. M. and 4 45 P M each day They arrive at the Ford Airport in Detroit at 10 55 A M and 6 25 P M , respectively Eastbound planes leave Detroit at the same time the planes leave Cleveland, and arrive at the same hour that westbound machines land at the other end of the line Each passenger is permitted to carry 20 lb of baggage without extra cost, but is charged 20 cents for each pound over that limit Direct connections with hotels, at both ends of the line are provided by company-operated automobiles

A delightful circle tour of Lake Erie, combining air and water travel, also is made The route is covered by planes of the Stout line from Cleveland to Detroit, from Detroit to Buffalo, by steamers of the Detroit and Cleveland Navigation Co , and from Buffalo to Cleveland, by steamers of the Cleveland and Buffalo Transit Co Time for sight-seeing in Detroit, and for an all-day visit to Niagara Falls is provided

Conducts Sight-Seeing Trips

In addition to the inter-city service, the Stout Air Services conducts daily sight seeing flights over Cleveland A 25 mi air trip over the city is made in Ford three engined monoplanes, such as are used on the Detroit-Cleveland line The cost of the tour is five dollars a passenger These flights are made every week-day between 1 00 and 4.00 P M., and after 6 30 P M On Sundays, they are made from 10 00 A. M until dark

Another company, which offers a long tour at a comparatively low rate, is the Thompson Aeronautical Corp The "Three-City" sight-seeing tour, featured by the organization, includes air visits to Cleveland, Elyria and Lorain The trip is 55 mi long, and is made at an altitude of about 1,500 ft Five-pasenger, Stinson-Detroiter cabin planes, powered with Wright "Whirlwinds," are used. The charge for the tour is but five dollars a passenger From Cleveland to Lorain, the route follows the shore of Lake Erie, while the return is made inland

The Thompson Aeronautical Corp also offers a short "airdrome flight," gives aviation instruction, does aerial photography and advertising, and offers complete passenger service to any desired point

Dungan Airways, Inc , offers a varied service However, it gives special attention to its school for pilots Its college of aviation offers approximately 60 hr of class room instruction at its headquarters in the downtown section of Cleveland Over 100 hr of shop practice is given in the modern brick and steel hangar at the Cleveland airport, where there is space for housing from 12 to 14 planes Because of the great number of planes at the Cleveland field, the students have an opportunity of studying in detail, practically all makes of planes now in use. Air instruction is given in dual control machines up to, and including, one hour of solo flying Each student also plans for himself, and navigates a cross-country trip of 75 mi without assistance from an instructor Harold E. Dungan, ex-war pilot, is president and treasurer of the company, and is dean of the flying school Other faculty members include Frederick L Smith, flight commander and engineering officer of the Ohio National Guard Aero Squadron located at the airport; Joseph T Bergeron, attorney and a lecturer on aeronautical law; Leon B. Lent, lecturer on airdrome management and commercial transportation, Edward R Ballash, instructor in parachute operation and rigging; Dr M Luckiesh, director of the Lighting Research Laboratory of the National Lamp Works of the General Electric Co and an internationally known scientist who is an instructor in meteorology, and Sydney S. Booth, registrar

Hangar of Dungan Airways, Inc , Ohio distributor of Fairchild planes and a dealer in Waco planes The Fairchild cabin monoplane in the foreground was recently sold by the Corporation to the B F Goodrich Co

Other services provided by Dungan Airways, include hangar service for visiting planes, all kinds of shop work on planes and engines, airdrome flights and air taxi service; contract flying, and counsel on all problems pertaining to aviation The organization also is Ohio distributor for Fairchild planes, and a dealer for Waco planes

Flying service the whole year through, to practically any destination, is offered by the Thompson Aeronautical Corp Trips to New York in three and one-half hours, Chicago in three hours, Detroit in one and one-half hours, and to Florida and California, in correspondingly short times, are included in regular service

Thompson operated planes include Stinson cabin planes, Laird open cockpit planes and Swallow, Travel Air and Eaglerock planes with Curtiss OX-5 engines These planes are used both for long flights, and for the short trips over Cleveland and vicinity The rates for short flights in cabin planes are five dollars per passenger for 15 min and for open-cockpit planes, three dollars per passenger for

(Continued on page 1224)

Two hangars of National Air Transport, Inc , at the Cleveland Municipal Airport

The Control *of the* Materials

By Edwin R. Douglas
Consulting Engineer

In several earlier articles, we have considered methods for controlling production by planning the labor Obviously, there will be no use in advance planning of labor unless it is sure that the material will be at hand when wanted for that labor to work on One way, not wholly uncommon, of attempting to ensure this, is to carry large stocks of everything conceivably necessary—a very poor policy for four good reasons. First, it ties up an excessive amount of capital, second, a great deal of storage space and shelving must be provided, and an undue amount of storeroom labor is required, third, a great deal of the material becomes obsolete before it is used, fourth, it does not accomplish what it sets out to do for—material shortages still occur.

There is another and better way, based on that exact knowledge which has formed the subject of these articles. It lays down two rules The first rule is to carry as standard stores only those materials called for on the standard specifications, and a minimum list of others found necessary, to carry these in quantities dependent on the regular requirements and the length of time necessary to get deliveries, and to keep adequate and well checked stores records of every such article, showing quantities required, purchased, used, and on hand, with carefully considered minimums showing the points at which stock should be replenished by purchase, or manufacture

Other Materials Purchased Specially

The second rule is that such other materials, as are from time to time required for special constructions, experimental developments, maintenance, etc, must be specially specified and purchased, but only in such quantities as are required for the work in sight. On receipt, they may be delivered directly to that work, or, if kept temporarily in the store room, are held there as a matter of convenience and certainty, marked for their particular jobs, and neither are recorded nor are considered as part of standard stores The value of such systems of materials control is today widely recognized and accepted.

The details of such systems will vary with the varying kinds of business. A plant having a standard line of manufacture, will require a standard line of supplies and materials and will carry most of them in stock. It may have very little occasion to order special articles not regularly carried in stock A factory which does a jobbing business, on the other hand, will purchase a great deal of its raw material specially for particular jobs and may carry very little standard stock All of which indicates that the purchasing and stores system installed in any plant should be adapted to its requirements, not merely copied

The airplane and engine building industries call for the carrying in stock of large quantities of small parts and materials It is quite possible that, with further standardization, the number of these items may be considerably reduced, but this is not the whole story. Undoubtedly, the stock room shelves of most such plants would be found carrying many kinds and considerable quantities of articles now seldom used, or quite obsolete, as well as those which are in active demand The reduction of such idle stocks is exceedingly important

Must Control Special Buying

These industries also call for the frequent purchasing of new and special materials This will continue, through the period of development and growth, probably for some time to come. This special purchasing must be so controlled as not to add to the volume of dead stock on the shelves, but cannot be done away with. In designing systems for these industries, we must, therefore, provide for both of these functions to a considerable degree Although they interlock closely at certain points, the functions of purchasing and stock-keeping are quite distinct, and will be considered separately It will be convenient to take up stockroom methods first

If we make a tour of inspection through any plant in these lines we shall find materials in great variety, but classifiable under certain main heads, such as Sheet and Strip Metals, Bar Stock, Irregular Rolled Sections; Tubing, Wire and Cable, Bolts and Screws, Nuts, Washers, Nails, Tacks, Rivets, Pins, Cotters, Fabrics, Cords, Covering Materials, Paints, Varnishes, Lacquers, Oils, Lubricants, etc, Pipe and Fittings, Millwright Supplies, Electrical Supplies, Instruments and Specialties, Lumber, Stationery and Miscellaneous Supplies

Under each of these are a number of sub-classes which, in turn, may be further subdivided according to types, sizes, qualities, etc., until we come to the individual parts and articles Thus, under the heading "Bolts and Screws," we have a class, "Cap Screws, Fine Thread, S A. E. Standard," under that a subclass, "Hex Head," under that, for instance, a size $\frac{5}{16}$ in x 2 in, and finally, many materials, qualities and finishes, such as "Brass," "Steel," "Heat-treated," "Cadmium plated," etc

To specify such an article unequivocally, it is necessary to designate all these things, thus

Cap Screw, S.A.E Fine Thread, Hex Head, $\frac{5}{16}$ x 2, Heat Treated No 2330 Steel

The designation is longer than the article Here lies a source of confusion and error If the designation be left to the draftsman who calls for it on the drawing, or to the mechanic who writes out a requisition, he will be apt either to leave out some of these details, or to call one of them by the wrong name. Thus, he may call it a

"bolt" or a "machine screw," which are quite different articles of different proportions, properties, and uses This difficulty is met to greater or less degree in the case of almost every kind of part or material that may be required, or kept in stock

'Calling a thing by its right name' is something that can't be done with any certainty In such a store room, there will be several hundred classes and sub-classes of materials, each in from two or three to a hundred or more possible sizes, and with a hundred or so materials, qualities, and finishes represented The total number of kinds of articles will run into many thousands No one man is likely to know and remember the properties of more than a few of these classes Hence the necessity for hand books, tables of standards, drawings of standard parts etc

But even when these standards have been provided it is necessary to tell which one is wanted, and to write its full designation on the drawings, specifications, and tickets Such names, as in the example above, are long and cumbersome They will be abbreviated, and how? Another opportunity for misunderstandings and mistakes!

The only way to be sure that parts called for and used will be the ones intended, is to give every standard part, or article, a definite number or symbol by which, rather than by its name, it may always be known and called for

The problem is no small one to provide numbers or symbols to represent so extensive a list of kinds, varieties, and sizes As in the case of drawing numbers and part numbers discussed in an earlier article, there are several plans which might be used. In the former case the consecutive plan and the classified plan were considered and each was found to have certain advantages Either might be used in the present case In fact, the part numbers, of whatever type will themselves be the stock numbers of all articles classified in the part number system But there will be a great variety of materials not covered by that system, and these must be provided for They are principally raw materials and standardized articles that can be bought in the open market, like sheets, tubes, bolts, screws, etc These are sometimes termed "open materials"

For open materials the straight consecutive plan is not very well adapted There are too many kinds and sizes to be covered If numbered consecutively as they happen to come along, they would be all mixed up—a hodge-podge. To reserve certain hundreds for certain kinds and varieties calls for a great deal of advance planning, so that room enough will be provided for each, but not too much It is merely a step toward the classified system

Loose-Leaf Book Has Advantages

Another plan contemplates listing all these materials on pages of a loose-leaf book, a page to a kind, designating them by page and line number The difficulties are partly, but not wholly removed This is, however, a workable plan

The best plan involves a thorough classification of materials, starting with headings similar to those listed at the beginning of this article, assigning numbers to the main heads, letters to the sub-classes and varieties, and numbers to the sizes Thus, if in such a list, Bolts and screws of different sorts receive the numbers from 10 to 19, then Cap Screws S A E Std might be No 13 If the types of cap screw be lettered, then Hex Head might be "H" If metals likewise be lettered and their varieties numbered, then Mild Steel No 1020 Cadmium plated, might be designated "S 23" Then a Hex Head Cap Screw S A E Std., 1020 Steel, Cadmium Plated, of any size, would receive the symbol, "13 HS 23," which is much less cumbersome than its name

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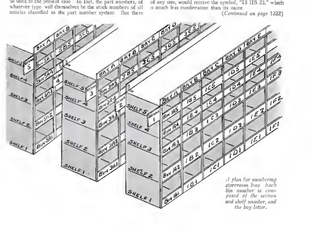

A plan for numbering storeroom bins Each bin number is composed of the section and shelf number, and the bay letter.

Aviation Country Clubs

A Plan to Create a Nationwide Chain of Flying Clubs is Inaugurated With the Organization of a Long Island Unit

CONTRACTS for the erection of a clubhouse and hangars for a new flying club to be situated on Long Island, N Y, will be let within the next few weeks This club, which will be operated on a more elaborate scale than any of the existing American aviation clubs and will compare favorably with the best golf and yacht clubs of the country, is the first unit of what is expected to be a nationwide chain of flying clubs of the same type

The Long Island club is the first "Aviation Country Club" It was formed by those living in and near New York who are members of Aviation Country Clubs, Inc, a non-profit organization incorporated under the laws of the State of New York to act as the parent body for the proposed chain of flying clubs These clubs, according to the plan, will be located near the principal cities of the country and, it is expected, will do much toward popularizing aviation among those of the wealthier classes by providing a congenial atmosphere for their participation in flying as a sport.

A membership, sufficient for forming the first unit of the chain, was obtained in the three months in which Aviation Country Clubs, Inc, has been in existence. In that time, also, applications for forming other units of the organization were received from Westchester County, N Y., New Jersey, Newport, R I, and Philadelphia, Pa However, it is probable that all efforts will be concentrated at first on the Westchester and New Jersey clubs It is hoped by the backers of the movement that these two units will be in operation by spring or early summer

Each Club to Have Private Field

Each unit in the entire chain will have a private flying field with all the necessary equipment There will be hangars, machine shops, and storerooms Each will maintain a fleet of planes for the use of its members, and a regular course of instruction is to be provided for those who do not know how to fly. The planes will be used also to provide an aerial taxi service for members Hangar space is to be furnished for the private planes owned by the members Servicing of these and the club planes will be performed by expert mechanics in the employ of the club, just as the flight instruction will be conducted by pilot-employees.

While flying will be the center of activities, the social end of club life is not to be neglected Each of the individual flying clubs will have its own clubhouse, which it is planned will compare favorably in size and furnishings with the structures now in use by some of the best country clubs Dances, card parties, and other similar forms of amusement will be arranged For the accommodation of the members, there will be a lounge, dining room, kitchen, office, first aid room, locker room, showers, bedrooms, a grill room, and card rooms in each club.

The relation of the national body to the individual clubs is much like that of the federal government of the United States to the various states. Each club will be a separate entity It will select its own members, elect its own board of managers, and will control its own finances At the same time, the affairs of the various clubs nationally will be under the general supervision and control of a National Advisory Committee, which is to be composed of the Board of Governors, elected by the entire membership, and a National Advisory Board, consisting of two members from each club

Just as every voter is a citizen of the United States, so will those elected to membership by the individual flying clubs become members of Aviation Country Clubs, Inc.

The ground floor plan of the model clubhouse designed by Warren Shepard Matthews.

There will be no local memberships All memberships granted will be in the national body, but the members will govern the affairs of the individual clubs with which they are affiliated, in a manner similar to the way in which the residents of a certain state govern the affairs of that state

The reason for the adoption of this system by the organizers of the movement is explained clearly in a club brochure

"Flying, by virtue of its very freedom from the restrictions of short distances and prescribed routes, takes on a far broader scope than the activities of the usual social club—golf, tennis, or polo," the booklet says in part "As an activity, it quickly becomes national and, by the same token, the formation of flying clubs logically must be considered from the national, rather than from the local viewpoint

"Membership in Aviation Country Clubs carries full membership privileges in all the flying clubs formed. The advantages of such membership are self-evident. For the cost of one club, a member has exclusive club and expert flying field facilities, practically at cost, in all cities where an Aviation Country Club is organized. While an aviation club could be immensely entertaining as a unit of social life, it would, without direct association with similar clubs, somewhat identically constituted and located at strategic points throughout the United States, fall far short of the ideal

Can Make Country Club Tour

"It will be but a short time before a member can make the 'Aviation Country Club Tour' He can actually circle the United States in comfortable, easy 'hops' from club to club He enjoys not merely the courtesies of each flying club, but actually a full and complete membership in every one His itinerary planned, he finds himself at nightfall circling the hospitable field of an Aviation Country Club His plane is serviced He spends a pleasant evening at the club, where perhaps there is a dance In any event, sleeping rooms, lounges, a locker room, showers and a restaurant await him

"In a movement involving the formation of flying clubs throughout the country, the necessity for a central, representative national committee, is quite obvious This committee, which will be known as the National Advisory Committee, will promote cohesion of thought and effort, assure a sound financial policy, keep a requisite degree of uniformity in the type and equipment of each club, and will bring to bear, on the problems of each, a collective knowledge, experience, and ability to purchase"

The new flying club movement is receiving the support of many prominently identified with the aircraft industry and others interested in the development of aviation Aviation Country Clubs was incorporated by Sherman M Fairchild, president of Fairchild Airplane Mfg Corp ; Charles L Lawrence, president of Wright Aeronautical Corp , James B Taylor, president of Air Associates, Inc ; George B. Post, president, Free Bottom Craft, Inc.; William A Rockefeller, who is a director of several air transport lines; Robert Law, Jr., a director of the Murray Hill Trust Co , and Earl D Osborn, publisher of AVIATION.

These seven men form the first Board of Governors of Aviation Country Clubs, Inc An organization committee and a national membership committee have been formed for conducting the work of establishing the individual clubs. Miss Ruth Nichols, who made the first non stop flight between New York and Miami, Darwin J Adams, and John S Reaves are members of the organization committee. Miss Estelle Manville, George

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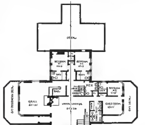


The second floor plan of the clubhouse designed as a model for the structures erected by the individual units of Aviation Country Clubs, Inc.

A reproduction of a painting showing how the club house of a typical Aviation Country Club will appear.

Merchandising Airplanes

A Discussion of the Methods of Distributing and Selling Aircraft and the Necessity for a Highly Organized System

By H. Lee
Secretary, American Aircraft Corp
Los Angeles, Calif.

LIKE any other commodity, the airplane is subject to the general laws of merchandising Each of the various plane manufacturers throughout the country is following some one of the usual methods of distribution Some manufacturers sell direct to the consumer This method usually is employed by those, who have not reached sufficient production to be able to take care of wholesale buyers. Others appoint direct factory dealers, who are really salesmen of the factory. They carry little or no stock on hand, either of planes or parts, but take orders from a demonstrator. Lastly, there are the manufacturers, who have perfected their factory methods so that they obtain a large enough production to permit the appointment of distributors with large territorial precincts, within which, they have protected selling rights. Under these distributors, there are dealers with definite selling territories, who in turn have salesmen to contact with the ultimate consumer

The manufacturer, employing either of the first two methods, usually runs into difficulties when he reaches the point where he must have a widespread sale of his product in order to keep ahead of production In a case like this, as a rule, he finds that he has set his retail price too low to enable him to give the distributors an adequate margin of profit The result is obvious

At first glance, the latter plan may seem to be expensive and cumbersome. In reality, it offers the most economical method of obtaining widespread distribution. The factory contracts with its distributors for a definite number of planes a year in advance, and can arrange its purchasing and production schedules accordingly. The distributor knows what deliveries he may expect each month, for a year ahead Through his dealer organization, he can dispose of his quota months in advance Such a plan

Front quarter view of a Stinson Junior, powered with a Warner "Scarab" engine

enables the manufacturer to use the best production methods possible, thus reducing factory costs The distributor and dealer, by selling in large quantities, can reduce their selling costs, and so the consumer in the end is able to get better merchandise at the lowest price.

Hand in hand, with the selling of any mechanical product, goes the servicing of it after it has reached the consumer Many a worth-while article has been a poor seller, simply because there was no one interested in seeing that the owner obtained the best possible results in its use The "factory distributor-dealer" plan of airplane selling insures a high standard of service. The factory, through quantity production methods, can have standard parts capable of being used on any one of its planes with-

Rear quarter view of a Travel Air standard biplane equipped with a Warner "Scarab" engine

out reference to the serial number. The distributor can carry a stock of parts on hand, and be sure that they will be serviceable when required The dealer can have his stock readily available for use as required and the owner can replace worn, or injured parts without delay

The importance of this feature of merchandising airplanes was brought out noticeably when the National Air Tour reached Los Angeles A well-known plane came to the field of the American Aircraft Corp for servicing The rudder and one of the ailerons was damaged to such an extent, that replacement was necessary Although the plane had a special "paint job," the new parts were installed, and were painted to match. As a result, the pilot was able to leave on time Another popular make of plane was delayed for several hours, because its tail skid shoe had worn out, and the local factory agent did not carry an adequate stock of parts

Together with the merchandising plan, advertising campaigns are carried on by factory, distributors and dealers Reaching the actual retail purchaser in selling airplanes is much the same as it is in other lines. Advertising brings in leads, which are followed up by personal calls of the salesmen Students of flying become familiar with the planes on which they are trained, and form a fruitful field for retail sales Buyers will come to the airport seeking information Others must be sought out, "cold turkey," as the salesmen say The successful retail airplane salesman will use a combination of these avenues of contact.

Two years ago, the average plane sold was the three-place open cockpit type This plane could be equipped

(Continued on page 1210)

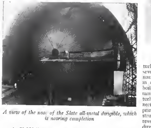
The Slate Dirigible

An Experimental All-Metal Airship With the "Egg-Shell" Type Hull Driven by a Steam Operated Blower in the Nose

THE short-hull, all-metal dirigible soon to be completed by the Slate Aircraft Corp., of Glendale, Calif., embodies several revolutionary departures from conventional lighter-than-air design, and construction Thomas Benton Slate, who has developed a number of important inventions during the past 25 yr., is the designer of this unusual airship Power for this interesting experiment about to be tested, is provided by steam turbines of entirely new and simple design; propulsion is accomplished by an ordinary straight blade centrifugal blower mounted in the nose of the ship, and fuel can be carried without detracting from the gross payload capacity

The "egg shell," or double arch type of hull construction, eliminates the interior frame necessary in present types of dirigibles. The gas-tight metal cover acts as the gas container as well as the frame of the ship In this construction the strength of the hull is built into the cover itself The cover is corrugated longitudinally to give it rigidity and these corrugations are spaced and the hull held in shape by circular ribs placed at frequent intervals along the contour Thus, a construction light in weight but very strong is attained, permitting the expansion and contraction of the metal without developing strains, and affording a fire and lightning proof gas container

This first airship of the all-metal hull type is 212 ft long and 58 ft at the largest diameter It has a total volume of 330 000 cu ft with a total lift of approxi-

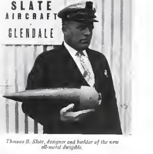


A view of the nose of the Slate all-metal dirigible, which is nearing completion

mately 21,000 lb and a payload of 7,000 lb, when using hydrogen as a lifting medium More than thirty-three per cent of its gross lift is used for payload

Steam power through turbins gives a most dependable form of power that is relatively silent, and permits continuous operation day and night for over fifteen months It is unaffected by climatic and temperature conditions and is used to heat the cabin when required. The one generating plant consisting of a high pressure, flash type boiler made up in two to four units, with condenser using but five gallons of distilled water to generate 500 lb.

The newly developed steam turbine adds considerable power while reducing the weight per horsepower to slightly over 3 lb This includes all weights of boilers



Thomas B. Slate, designer and builder of the new all-metal dirigible.

turbins and gearing The power plan is divided into seven units, there being that many turbins of varying sizes. One of 400 hp is directly connected to the blower in nose of ship Steam for this is piped to it from a boiler in the cabin Two auxiliary power units are mounted, one on each side of forward end of cabin These turbins will develop 40 hp each and will be directly connected to an ordinary airplane propeller These are primarily to offset the parasite resistance of the cabin structure to the slip stream But the turbins are full reversable by merely injecting the steam from the opposite direction and these propellers can be used to stop the forward motion of airship or assist in turning and holding ship in position while it is loaded or unloaded of passengers and cargo One small turbin of about 8 hp is used to generate current for radio transmitting and to

(Continued on page 1208)

Development *of* Aircraft Propellers

By Lieut. Comdr. C. H. Havill, U. S. N.
Bureau of Aeronautics

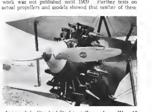
BEFORE the first successful flight of the Wright brothers in 1903, various mathematicians speculated on the proposition that an air propeller was analogous to marine propellers There were two schools of thought at that time, one of which claimed that if proper corrections were made for the difference of density between air and water that marine practice in propeller design would apply equally well to air propellers, the other school of thought maintained that air being compressible, and having less density, and being subject to thermodynamic changes made it necessary that an entirely new theory of propeller design be produced The air propeller first used by the Wright brothers in 1903 followed closely the marine theory but was modified to some extent to fit the then existing aerofoil theory It was made of a light frame covered with canvas

From this humble beginning the air propellers of the next six years were made largely on the system of trial and error Meanwhile a Polish scientist named Drzewiecki was developing the theory that any one cross section of a propeller blade could be considered as an aerofoil section operating under certain conditions of air flow and that the summation of the effect of each section along the blade would give the total effect On tests of various models it was found that his theory did not always fit the case, that there were still some unknown variables that entered into the performance. From consideration of these results an alternative propeller theory was put forward by R E Froude, famous for his research work on marine models in the towing basin in

A Hamilton metal propeller in use on a "Whirlwind" powered plane. The spinner completely hides the hub

England This theory assumes that the propeller is replaced by the equivalent to a special kind of disc moving at a velocity V relative to the air and having some device for imparting an acceleration to the air passing through the propeller disc. Then considering the mass of air being moved it was deduced that thrust equals rate of change of momentum This alternative theory has been called the "momentum theory"

Thus, there existed in 1906, two logical theories explaining just how a propeller acts, the Drzewiecki or blade element theory and the momentum theory In this connection credit is to be given to Mr Lanchester for independently expounding the blade element theory in his "Aerodynamics" published in 1907, as Drzewiecki's work was not published until 1909 Further tests on actual propellers and models showed that neither of these



A view of the Standard Steel propeller used on a Waco 10 powered with a Wright "Whirlwind" engine

theories exactly fitted the case, so an attempt was made to combine them so that theory would fit the test results.

In combining these theories it was found that both were fundamentally sound but that the assumptions on which each was based did not accord with actual conditions It was found that the air acquired an increase of velocity ahead of the propeller which is known as the inflow velocity, that further the outflow velocity was not uniform over the propeller disc and that a certain rotational velocity was given to the slipstream With these modifications of translational and rotational inflow velocities applied to the "Blade Element Theory," a method for designing an aircraft propeller was developed which is the one in use today The problem of actual design, however, is not so simple as it appears, as experience and engineering judgment must be used to properly qualify the blade element method

During the war a large amount of air propeller designing was done by trial and error The method in use at that time was to design three or four wooden propellers for a particular new airplane and to put into quantity production the propeller which gave the best performance for that type of aircraft The net results of these best propellers were analyzed, curves were plot-

(*Continued on page* 1206)

The "Kitty Hawk"

A Three Passenger Open Biplane Powered With a Ryan Siemens Engine Cruises at 90 M.P.H. and Lands at 40 M.P.H.

PRODUCTION is to be increased in the near future on the "Kitty Hawk" biplane, manufactured by the Bourdon Aircraft Corp., of Hillsgrove, R I The first unit of six planes has been completed and it has been found necessary to increase the rate in order to meet the demand The Kitty Hawk is a three place, open cockpit biplane of conventional design, powered with a seven-cylinder Ryan Siemens radial air cooled engine developing 96 hp at 1750 r p m Other power plants may be installed by a simple modification of the cowling and engine mount, which can easily and quickly be detached by the removal of several bolts

Engineering work on the Kitty Hawk was started in November, 1927, by Allen P Bourdon, designer of the plane Structural designing and stress analysis were handled by F T Kurt and J E Summers of the engineering department of the Corporation The first plane was test flown in May, 1928 The plane being designed for a radial engine permits of a concentration of weights near the center of gravity which contributes to the maneuverability Variations in pay load cause only slight changes in the position of the center of gravity

The Kitty Hawk has a wing span of 28 ft, an overall length of 21 ft 11 in, and an overall height of 8 ft 6½ in The weight empty is 1,115 lb and the gross weight 1 888 lb It has a high speed of 112 m p h a cruising speed of 90 m p h and a landing speed of 40 m p h The rate of climb is 600 ft per min and the cruising range is 500 mi with a gasoline capacity of 37.5 gal

In construction the plane conforms to new production practices, having wood wings and a fuselage of welded steel tubing Instead of the usual chrome molybdenum steel in the fuselage structure, mild carbon 1025 is used because of its good welding characteristics This practically eliminates any possibility of using stock of inferior quality for field repairs The fuselage is of Pratt truss construction with a minimum of eccentricities at welded joints Chrome molybdenum steel tubing is used for landing gear and tail skid

The U S A 27 airfoil section is used and the wings are of equal span and rectangular in plan form Routed spruce spars and Warren truss ribs with glued and nailed plywood gussets are used in the wing structure As in the case of the wings, ailerons are constructed of wood and covered with fabric Both upper and lower wings have ailerons which are interchangeable and there is practically no gap between their leading edges and the surface of the wing where they are hinged This is accomplished by a duralumin fairing on the wings and a cylindrical duralumin fairing on the back of each aileron All covered wood and metal parts are Linoiled before covering In-

(*Continued on page* 1205)

Front quarter view of the "Kitty Hawk" biplane equipped with a Ryan Siemens engine

New England Aero Show At Boston Attracts 70,000

Manufacturers Find Many Sales Leads At Mechanics Building Exhibit

BOSTON, MASS.—The third New England Aviation Exposition held in Mechanics Building, Boston, October 1-6, attracted more than 70,000 attendance, resulted in numerous excellent leads for the sale of airplanes, showed the first of the new 110 hp. Siemens-Halske engines in a new Bourdon Kitty Hawk biplane, and accounted for the enrolling of numbers of flying students and the sale of many model airplanes and flying gear.

Without crippling flying activities at any of Boston's three active flying fields, 16 airplanes were in the hall. The show was the occasion for the consolidation of the American Airports Corp of New England and Keniston, Inc., thus giving New England one of the strongest airport construction and maintenance firms in the country.

On entering the hall the Pratt & Whitney exhibit in charge of D. Christian Gauss faced the entrance. Behind it stood the Velie Monocoupe seaplane on its Edo floats. Stretching back through the hall were the other airplanes with the wall spaces given over to booths. Rand McNally occupied the first booth on the left. The new standard aviation map filled the back wall with smaller maps, a globe, the map used by Art Goebel on his record trans-America flight, and other interesting documents keeping Douglas Haight, George E. Seymour, and Grant Schlater busy answering questions.

Souvenirs Given Away

The Kendall Refining Co. had a double booth and showed the now famous board which graced the Detroit and Los Angeles shows. Their free helmets and pilot, engine, and plane log books caused a furore among local pilots and near pilots. Harry R. Chase and his son, Harold M. Chase of Boston kept the booth. Standard Oil of New York had one of the new runway level field gas and oil service units with hand and engine pumps on display. C. B. Jones, R. W. MacMillan, A. V. Shaw, A. C. Marshall, H. G. Bigelow, and W. S. Folant officiated. Wright and Ditson displayed the full Spaulding line of winter flying suits. Colonial Air Transport, Inc., had arranged special air mail cancellations for the show and a different colored ink pad was used each day for philatelists. The Boston Evening Transcript prepared a special above the clouds souvenir card for the 10,000 air mail envelopes and these were mailed all over the country from the show. A Service Booth was a feature of this year's Boston show. Firms taking advantage of the cooperation given the industry included Carr Fastener Co. of Cambridge with their Dot Lubrication system, the Goodrich tire people, Westinghouse Micarta Propellers and airport lights, Paul K. Guillow airplane games, Harris oils, Iver Johnson flying togs, Ideal Clamp Co., Strauss and Bugeleisen, Atlantic Aircraft Corp. The show marked the first assembling of the new Massachusetts Institute of Technology Aeronautical Engineering Society training glider.

Kitty Hawk Plane Shown

The new Kitty Hawk had the place of honor among the airplanes, being the only modern New England produced plane.

A new Curtiss Robin was the only out-of-New England airplane in the show. Edward T. O'Toole flew a Waco 10 up from Martha's Vineyard for the show and decorated it with a sign, "This plane has flown 75,000 miles, three times around the world, and is still in good condition." Robertson Ayling entered his Challenger OX from Hyannis. Harold Dennison sent in a Waco 10 from Atlantic, Mass. Allen Bourdon was present all week with his Kitty Hawk. The Boston Airport Corp. showed a Fairchild cabin monoplane on wheels and beside it the Fairchild floats on which the plane operated this summer as well as a new Travel Air OX.

Bay State Flying Service showed the gold painted American Eagle stripped fuselage which was at Los Angeles, a tiny Irwin Meteorplane and a new OX American Eagle. Old Colony Airways was unable to show its Ryan due to charter work but had a new Eaglerock OX plane in the show.

Skyways, Inc., had a Stearman Whirlwind with navigation and landing lights, one of two they flew in the night formation which ushered in the show the night of October 1st, and the Monocoupe seaplane. Sumner Sewall entered his Monocoupe.

Display Early Type Plane

A plane built in Boston right after the war, the then famed Whittemore Hamm with its five longeron membered body forward and monocoque type fuselage from the rear cockpit rearwards, was placed in the show by a group of flying club enthusiasts and served to emphasize the advance of the past 10 yr. in airplane design. Several of the pilots visiting the show had actually flown it years before.

The show was free from the Army and Navy planes which in past years have been relied upon to pad out the meagre commercial showing. The only service plane in the show was a De Haviland which the Boston Airport detachment had been waiting to demolish. It was sent over to give the youngsters something they could crawl around on without fear of damage.

Aside from the engines in the planes, a Le Rhone rotary of war time vintage was mounted on a stand so it could be turned over by hand, a 150 hp. Hispano-Suiza was shown, and Pratt & Whitney, besides a Wasp and a Hornet had a crank case, master connecting rod, and a cylinder assembly. The Brookline Aero Club, in addition to photographs and other souvenirs, had a Zeppelin truss. The M. I. T. group had a wing from the 1925 Pulitzer Army racing plane, and a rib display.

Demonstrate Whirlwind Assembly

The maintenance department of the Boston Airport Corp. gave a Wright Whirlwind assembly demonstration. John and Walter O'Toole of the Beacon Air Service covered and doped a Pitcairn Mailwing wing at the show. Model planes and gliders were flown in the hall. Two model airplane contests for school boys, one for flying and one for scale models, were held. H. M. Murdoch, Fellow of the Royal Photographic Society of England, showed her large photographic collection "Advancing Aviation." The First Corps of Cadets, a Boston National Guard anti-aircraft unit, gave searchlight demonstrations the opening night and then put two of their big lights in the hall beside their three inch anti-aircraft gun. The 101st Observation Squadron rolled their photographic laboratory truck in and operated it at the show. The R. O. T. C. detachment at Tech sent over photos, cut away bombs, and similar material.

Emsco Working On Aero Diesel

LOS ANGELES, CALIF.—Development of an aircraft Diesel engine has been started by the Emsco Aero Engine Co. of Los Angeles, according to the announcement of E. M. Smith, president. This concern has been incorporated for $500,000 and now plans to erect a $250,000 factory at one of the airports near Los Angeles.

Leigh M. Griffith, formerly identified with research work at Langley Field, has been named vice president and general manager of the new company. He stated that the new Diesel engine design showed exceptional promise and should be under production within the next eight months. The first engine will be of 1,000 hp., it is said.

Space at Chicago Show in Demand

Military Aspect to Be Lacking At International Aero Exposition

CHICAGO, ILL.—The tangible results of what American industry can accomplish without help of government subsidy will be shown December 1 to 9 at Chicago when the Aeronautical Chamber of Commerce holds its first all-commercial International Aeronautical Exposition. It follows other shows of aircraft but will be the only one yet held with the military plane wholly lacking and given over exclusively to air transportation equipment.

The Aeronautical Chamber has leased the Coliseum and the First Regiment Armory, Chicago's largest exhibition halls. A canopied walk affords entrance from one building to the other, making the exposition practically under one roof. Though containing more than 100,000 sq. ft., requests of manufacturers of aircraft and accessories have reached the Chamber in such number that it is questionable if these two buildings will be sufficient in size to house the displays of all those who have made application.

Accessories to Be Separate

The available space has been allotted so that airplanes will be shown exclusively in the Main, North, and South Halls of the Coliseum and in the Armory. Accessory exhibits will be placed in the Coliseum Grand Ball Room and in the balcony.

The Chicago Municipal Airport will be available at all hours to those manufacturers wishing to keep planes in readiness for actual demonstrations. Those who will fly planes which will be put on exhibition will find cartage facilities ready at a minimum cost.

Chicago's official help has been assured by the active part the Mayor's Aero Commission and the Aviation Committee of the Association of Commerce are partaking in the plans.

Tibbs to Distribute Robin

OKLAHOMA CITY, OKLA.—Burrell Tibbs, conductor of the Tibbs Flying School here, has been named Central Oklahoma representative of the R. F. Garland Aviation Co., Tulsa, and will now distribute the Curtiss Robin in 15 counties. Tibbs is also an Eaglerock dealer.

Thompson Announces Promotions

CLEVELAND, O.—William H. Spire of the Cleveland plant of Thompson Products, Inc., has been named director of engineering and Richard E. Bissell chief engineer, it is announced by C. W. Miller, vice-president and general manager.

Lands in City

Showing the recent landing of the Ryan Siemens powered Goodyear baby dirigible Puritan on a building at Washington. John A. Boettner was at the controls.

Addition Is Completed To Stearman Factory

WICHITA, KAN.—The new unit of the Stearman factory here, providing 15,000 additional square feet of floor space is ready for occupancy. The new unit is to be devoted to the building of larger and higher priced planes, most of which will be taken on special order, though built to specifications that will not interfere with the basic Stearman designs.

Three special planes with high powered engines for an air mail and passenger carrying concern in the East will be built almost immediately, Lloyd Stearman, president of the company, has indicated. They will cost in the neighborhood of $20,000 each and will be powered with Wasp or Hornet engines. The company already has started production of closed types.

Plan New T. A. T. Service

NEW YORK, N. Y.—Air passenger service with sleeping accommodations is to be started between Columbus, O., and West Coast cities, according to a statement made by C. M. Keys, president of Transcontinental Air Transport, Inc. This will be in addition to the regular plane-rail service being developed by T. A. T. No date for the new service has been set.

Chicago Club Holds Meet

CHICAGO, ILL.—Stunt flying, parachute jumping, balloon busting, bombing contests, and the regular air races were features of the Chicago Flying Club air meet held October 7 at the field at 8400 W. Irving Park Blvd.

Sikorsky Concern In Reorganization

New Firm Gives Commercial Sales Right to Curtiss Flying Service

NEW YORK, N. Y.—In order to increase production as well as bring about the formation of a new company to be known as the Sikorsky Aviation Corp., a readjustment of the Sikorsky financial structure is announced here. More capital will be introduced, and the new company will acquire the assets and business of the Sikorsky Manufacturing Corp.

With this announcement came another that the new firm has entered into a contract giving the Curtiss Flying Service, Inc., exclusive rights for the sale of Sikorsky planes for commercial use in this country. A similar contract furthermore has been made with the Curtiss Aeroplane Export Corp. to care for foreign business.

"The introduction of new capital," according to A. C. Dickinson, President, "is chiefly for the purpose of increasing output. We are now producing one plane every 10 days. By the close of the year this will be increased to two planes a week, through doubling production capacity, and the schedule for 1929 calls for an output of 100 planes."

Stock in Three Groups

Under the new arrangement the Sikorsky Aviation Corp. will have a capital of 200,000 shares of no par value. Of the total, 100,000 shares will be retained by the present management. The other 100,000 shares has been underwritten by G. M.-P. Murphy & Co., James C. Willson & Co., and the National Aviation Corp.

At the first official meeting of the new corporation an Executive Committee was elected and several new members were added to the Board. E. O. McDonnell of G. M.-P. Murphy & Co. is chairman of the executive committee. In addition to Mr. McDonnell the board includes: James Bruce, vice president of National Park Bank; J. Cheever Cowdin, vice president of Blair & Co. Inc.; A. C. Dickinson, president of the company; Victor Drury, O. A. Glazebrook, Jr., Henry G. Hotchkiss, Chas. S. "Casey" Jones, H. O. King, John Newell, Jr., Joseph E. Otis, Jr., Earle Hay Raynolds, Igor Sikorsky, vice-president and chief engineer; Andrew R. Smith, R. C. Stanley, H. E. Talbott, Jr., B. Tompkins, vice president Bankers Trust Co., and James C. Willson.

Berlin Show Under Way

NEW YORK, N. Y.—Airplane manufacturers of 18 nations are being represented at the International Air Traffic Exhibition, which opened October 7 in Berlin according to word received here.

Leaders in Aviation Gather At National Safety Meeting

Authorities Participate in Conference Sponsored by Guggenheim Fund

NEW YORK, N Y—Leaders in the aviation industry gathered October 4-5 at the First Aeronautical Safety Conference held at the Hotel Pennsylvania under the joint auspices of the Daniel Guggenheim Fund for the Promotion of Aeronautics and the National Safety Council. The meeting was held in conjunction with the Seventeenth Annual Safety Congress and was open to the public. A number of papers on the safety aspect of aviation were read by well known authorities on the subject during the two morning and two afternoon sessions of the conference which were well attended

In considering the subject of aerial transportation and the factors contributing to its safety, Harry F. Guggenheim, head of the Foundation, selected several general topics for discussion. These included aircraft, airports and airways, medical aspects of aviation, the public and flying, passenger safety, flying and ground personnel. The subjects discussed on the first day of the conference included aircraft, structures and materials in regard to aviation safety, airports and airways, aids to navigation, Medical aspects and safety of airship operation.

Dirigibles Considered

A special section for consideration of safety in lighter-than-air craft was arranged in view of the growing interest in this form of air transportation. This was done in an effort to stimulate public confidence in dirigible balloon as a transportation medium. Among the speakers on this subject were Senator Hiram Bingham, of Connecticut, president of the National Aeronautic Association and Edward P. Warner, assistant secretary of the Navy for Aeronautics

The feature of the program on the second day was a paper by Col Charles A Lindbergh on "The Requirements and Training for a Commercial Pilot," which he read before 1 500 persons. In his discussion he stated that there was a need for more complete training for students desiring to become pilots. A discussion of requirements, installation, field service and maintenance of aircraft engines was conducted by Charles L. Lawrence, president of the Wright Aeronautical Corp., and George Meade, chief engineer of the Pratt & Whitney Aircraft Co.

Technical Problems Stressed

Among the other subjects considered were the handicap of flying in bad weather, aviation instruments and their use in fog flying; and the technical safety problems related to the technical development of aircraft. Papers on these subjects were read by J C Hunsaker, of the Bell Telephone Laboratories, Lieut. Albert F Hegenberger, U S A, Prof. Alexander Klemin, of the Guggenheim School of Aeronautics, New York University, Thomas Carroll, chief test pilot National Advisory Committee for Aeronautics, and Ted Wright, chief engineer, Curtiss Aeroplane and Motor Co

Wesley Smith, veteran National Air Transport mail pilot, Major John Berry, manager of the Cleveland Airport and Dr. L. H Bauer, medical inspector of the Bureau of Aeronautics, were also among the speakers

Many Airplanes Take Part in Meet at Albany

ALBANY N Y—A large number of planes and pilots took part in the recent meet held at the Albany Airport under the auspices of Fliers Inc. The meet was officially opened October 3 and was to have been concluded October 6, but high winds and unfavorable weather conditions on October 5 necessitated postponement of the races scheduled for that day and resulted in extending the meet until October 7.

Several tri engined Ford planes and the Fokker monoplane Friendship were among the visiting planes. A number of exhibition and passenger flights and several races were included in the events. On Saturday evening October 6 a dinner was given to visiting pilots and guests at the De Witt Clinton Hotel

Graf Zeppelin Ready

NEW YORK, N Y.—Radiograms received here from Friedrichshafen, Germany, state that final tests have been completed on the Graf Zeppelin and, as we go to press, Dr Hugo Eckener is awaiting favorable weather reports before announcing the time of departure of the giant dirigible for the United States. Preparations are being made to receive the airship at Lakehurst, N. J.

Gets Business for Pioneer

BROOKLYN, N Y.—Miss B Davis, secretary of the Pioneer Instrument Co, this city, has recently brought new business to the company totaling $172 000

Loud Speakers Used in Factory

COLORADO SPRINGS, COLO—Officials of the Alexander Aircraft Corp. now call any one of the 450 employees in the new plant through 20 loud speakers placed at strategic points in the main factory and others in the smaller buildings adjacent. This arrangement enables reaching a man directly without the necessity of relaying a call in the usual manner from superintendent to foreman. If an officer wishes to speak with the foreman of the woodworking department, a call is put through on speakers in that section of the plant. In case the foreman is elsewhere in the factory, the call is sent out to all sections

Many other advantages are found in this system. Officials address the employees without need of leaving their desks and without the necessity of the workers leaving their benches. The speakers are also used for sending music during noon hour and during overtime work periods

Dinner to Day Given By Paterson Chamber

PATERSON, N J—A large gathering of persons prominent in the aeronautic industry and in civic and business life in Paterson recently attended a dinner at the Alexander Hamilton Hotel for Charles Healy Day, of the Gates-Day Aircraft Corp. The dinner was tendered by the Paterson Chamber of Commerce and constituted the official welcome of that organization to the Gates Day company, which established its plant in Paterson several months ago

Among the speakers besides Day were The Hon William P MacCracken, Jr, assistant secretary of Commerce for Aeronautics, Ivan R. Gates, president of the Gates-Day Corporation, Rubin Roffin treasurer of the company, Guy Vaughan vice-president Wright Aeronautical Corp, James Wilson, president Paterson Chamber of Commerce, and Mayor Wilmer Cadmus of Paterson.

Orders 140 Propellers

TETERBORO AIRPORT, N. J—What is said to be the largest single order for commercial airplane propellers was placed by the Fokker Aircraft Corp. when that concern purchased 140 steel two-and three-blade "props" from the Standard Steel Propeller Co. of West Hempstead, Pa. The propellers will be used on a number of Fokker monoplanes now being manufactured at the factories here, in Passaic, N J, and Wheeling, W Va

A. C. of A. Firm Fully Organized

Board of Directors Is Elected For Company Replacing Pan American

NEW YORK, N Y—Final organization in New York of the Aviation Corporation of the Americas and the election of its first board of directors was announced this week. Through the new company, which is taking over Pan American Airways Inc., operator of the first international mail and passenger service from the United States, North, Central, and South America will be linked by a single airway, bringing the West Indies and Panama within one and two days of the United States

The new company, forming what is believed will be the largest international air mail and passenger system in the world is headed by Richard F Hoyt as chairman of the board and Cornelius Vanderbilt Whitney as president. It is sponsored by men identified with the development of American air transportation and prominent banking interests

Through Pan American Airways as its operating company, the Aviation Corporation will project and manage an airway system extending 4,023 mi through 12 countries, aggregating a yearly operating distance of 2 441 366 mi. Of this total 1,992,086 mi will be flown on a daily schedule between Miami and Havana, and Miami and the Panama Canal Zone, and the remaining 449,280 mi will be added on a three day a week schedule between Miami and Porto Rico. Extensions already under contract and additional lines to be put into operation will nearly double this aggregate mileage. Contracts were awarded by the Post Office Department at $2 per airplane mile

Directors Named

Serving on the board of directors of Aviation Corporation of the Americas which is also the new board of Pan American Airways, R F. Hoyt, Haydon, Stone & Co., C. V Whitney, director Guaranty Trust Co., J T Trippe, president Pan American Airways, Robert Lehman, Lehman Bros., Lyman Delano, executive vice president Atlantic Coast Line Railroad, S M Fairchild president Fairchild Aviation Corp, W A Harriman, W A Harriman & Co, Leonard Kennedy, Leonard Kennedy & Co, George Mixter Stone & Webster, S Sloan Colt, vice president Farmers Loan & Trust Co, E. O. McDonnell member G M P Murphy & Co, W H Vanderbilt, Grover Loening president Loening Aeronautical Corp, Graham B Grosvenor, vice president Fairchild Aviation Corp, John A Hambleton, Hambleton & Co., R B BeVier, president BeVier & Co. Robert W. Atkins, Hayden, Stone & Co.

The first of the new contracts, calling for daily service between Miami and Havana via Key West is already in operation. The second contract to go into operation will be between Miami and San Juan Porto Rico via Cuba Haiti and the Dominican Republic. The third contract route from Miami to the Canal Zone will operate via Havana, Yucatan, British Honduras, Nicaragua, Costa Rica and Panama.

Under these contracts and subject to the final approval of the Post Office Department, the company also has the option to extend service at the rate of $2 per mile from San Juan via Windward and Leeward Islands to Trinidad, and from the Canal Zone via Colombia and Venezuela to Trinidad, thence via British Guiana to Dutch Guiana, producing additional contractural routes which will almost double the original mileage.

The company holds contracts with the Cuban Government giving it preferential commercial privileges at all government airdromes either existing or to be developed. Construction of airports in other countries through which the system will operate has been under way since the contracts were awarded and are reported to be progressing rapidly

Velie is Testing 170 Hp. Engine

MOLINE, ILL.—A new 170 hp air cooled radial airplane engine is being tested here by the Velie Motors Corp of this city Pete Hill, president of the Travel Air Transportation Co, Wichita, Kan, is making the tests, the new power plant having been substituted for the Whirlwind engine on his Travel Air plane

The Velie firm now markets a five cylinder air cooled radial engine, the M 5 which develops 45 hp. The new power plant marks the entrance of the firm into the field of more powerful engines

Form Engineering Firm

SAN FRANCISCO CALIF — Formation of the Aeronautical Engineering Co., to offer complete service for aircraft design, construction maintenance, and repair and for the sale of accessories has been anounced here. The company is associated with the aeronautical engineering firm of Jenkins Pavian & Hillburn of San Francisco. The company maintains offices here and a factory in Alameda accessible to both the Oakland Municipal and new Alameda Airports.

Testing Sierra Monoplane

OAKLAND, CALIF—Built by Aircraft Industries Inc the new Sierra monoplane is undergoing a 1000 hr flight test at the hands of G H Willingham, test pilot of the concern

Dirigible Contract Goes to Goodyear

Great Cruising Ranges Promised For New ZRS-4 and ZRS-5

WASHINGTON D C—Contract to the Goodyear-Zeppelin Corp., for the construction of two great rigid airships for a total of $7 825 000 one to cost $5 375 000 and the other $2 450 000, was officially awarded by the Navy Department October 5. The new ships it is said, will have ranges two and one-half times greater than the present Los Angeles and will be capable of housing airplanes in special hangars within the hull. The latter are to be launched from the dirigible while in flight

Externally, the new airships will appear fuller and less slender than the Los Angeles. The fair lines of the hull will not be disfigured as in past practice by external cars containing the engines. The engines and the engineers will be housed within the hull, reducing the resistance and improving the safety. This is one of the lessons learned from the loss of the Shenandoah, where nobody who remained within the hull suffered any injury whatever

The propellers will be supported on brackets from the hull, driven by the engines through transverse shafts and bevel gears. An important and interesting feature is that the propeller axes can be turned into the vertical position to exert up or down thrust to assist in taking off or landing the airship

Helium to be Used

The hulls of the new dirigibles, to be known as the ZRS-4 and ZRS-5, will consist of duralumin longitudinal and transverse girders with steel wire bracing. The girders will be of a new type stronger and more efficient than hitherto used. The outside will be covered with the characteristic aluminized fabric drawn smooth and tight. The buoyant helium will be contained in eleven separate cells of gas tight fabric. The strength of the hull will be sufficient for storm or squall conditions approximately twice as severe as the Los Angeles could successfully encounter.

A notable improvement will be the provision of no less than three longitudinal corridors, and passageways completely around the circumference of each main transverse frame, giving access to all parts of the ship, so that inspection and repairs can be carried out in flight with a facility never before possible

N. Y. Firm to Produce Tanks

LONG ISLAND CITY, N Y—Industrial Motors, Inc., of this city, announces the beginning of production on duralumin and alclad fuel tanks for aircraft use. The company is located at 4533 Van Dam Street

World Conference Invitations Listed

Executive and Other Committees Named for Washington Meeting

WASHINGTON, D C—The list of 54 nations invited to be represented at the International Civil Aeronautics Conference held at Washington December 12-14, has now been made public and the executive and other committees have been named The Department of Commerce is sponsoring the event for which preparations are now well under way

Countries boasting developments in aviation and others planning to enter this new field of transportation are included in the list of nations asked to send delegates. The countries invited are as follows

Albania, Argentine, Austria, Belgium, Bolivia, Brazil, Bulgaria, Canada, Chile China, Columbia Costa Rica Cuba, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, Esthonia, Finland, France, Germany, Great Britain and the British Dominions Greece Guatemala Haiti Honduras, Hungary, Irish Free State, Italy, Japan, Latvia, Lithuania, Luxemberg, Mexico, Netherlands, Nicaragua, Norway, Panama, Paraguay, Persia, Peru, Poland, Portugal, Rumania, Salvador, Kingdom of the Serbs Croats and Slovenes, Siam, Spain, Sweden, Switzerland, Turkey, Uruguay, Venezuela

Executive Committee Named

The executive committee of the conference has been named as follows

Chairman William P. MacCracken, Jr. Assistant Secretary of Commerce for Aeronautics, Francis White, Assistant Secretary of State, Trubee Davison, Assistant Secretary of War for Aeronautics, Edward P Warner, Assistant Secretary of the Navy for Aeronautics, W Irving Glover, Second Assistant Postmaster General, Col Paul Henderson, vice president, Aeronautical Chamber of Commerce, Dr G. M. Lewis, director, National Advisory Committee for Aeronautics, Capt. E. S Land, Guggenheim Fund for the Promotion of Aeronautics, Sen Hiram Bingham, president, National Aeronautic Association; A. T Stewart, U S Chamber of Commerce, Leighton W Rogers executive officer.

Others Announced

Other committees which are now arranging for the conference were announced as follows Program—Chairman Starr Truscott, National Advisory Committee for Aeronautics, James C. Dunn, Department of State Maj Ira Longanecker War Department; Lieut Comdr George F Chapline, Navy Department Maj Clarence Young Department of Commerce George P Tidmarsh, Aeronautical Chamber of Commerce

Finance—Harry Guggenheim chairman Guggenheim Fund for Promotion of Aeronautics, William McNeir, Department of State E. P Howard Department of Commerce

Entertainment and Transportation—Maj Clarence Young chairman, Department of Commerce, J C. Dunn Department of State Capt

New York Aero Show is Planned

NEW YORK, N. Y.—To be the first aero show in New York for some years, the New York Aeronautical Exposition has been scheduled to be presented in the Grand Central Palace, Feb. 6-13, 1929 Aviators' Post No. 743, American Legion, composed entirely of war fliers is sponsoring the event. A complete line of planes, engines, and accessories will be on exhibit, according to John Dwight Sullivan, commander of the post.

E E Adler War Department, Lieut. Comdr D C. Watson, Navy Department, J F Victory, National Advisory Committee for Aeronautics, A. T Stewart, U S Chamber of Commerce, Daniel Shaeffer, Aeronautical Chamber of Commerce, Henry Berliner, National Aeronautic Association.

Printing—W Irving Glover, chairman, Post Office Department Harry H. Elee, Department of Commerce, A. T. Stewart, U S Chamber of Commerce.

Banquet and Luncheons—Lieut. Comdr W H. Harrill chairman Navy Department, Myron Rohr Department of State, Edward P Howard Department of Commerce, William E Mayo, Aeronautical Chamber of Commerce, Temple Joyce National Aeronautic Association.

Publicity—Chance Vought chairman, Aeronautical Chamber of Commerce Robert Scotten Department of State, Maj Ernest Jones Department of Commerce Robert S Regar Post Office Department, Capt E. S. Land Guggenheim Fund for Promotion of Aeronautics; Bruce Lambe, U S. Chamber of Commerce, Paul Wooton, Conference of Business Paper Editors

Escort and Reception—Lieut. Comdr E. H. Williams General Staff, chairman War Department James C Dunn, Department of State Lieut Comdr W K. Harrill, Navy Department H H. Elee Department of Commerce Maj Donald A. Davison District Commissioners.

Credentials—Sydney Y Smith, chairman, Department of State, E P Howard, Department of Commerce; Harold F Pitcairn Aeronautical Chamber of Commerce Starr Truscott, National Advisory Committee for Aeronautics

Hotel Reservations—D A Skinner chairman, U S Chamber of Commerce, Harry H. Elee, Department of Commerce.

Heads Embry-Riddle School

CINCINNATI, O—Robert L. Rockwell, Lafayette Escadrille flier has taken charge of the Embry-Riddle Flying School at Lunken Airport Rockwell will instruct all students of the school in aerobatics and standardize the instruction methods of every pilot instructor He will also give lectures in the ground school

Mayer Orders Cessnas

WICHITA, KAN—E P Mayer of the Mayer Aircraft Co has placed his order for two more Cessna monoplanes following the successes of that type craft in the recent transcontinental derbies

Gets Robin Sales Rights

GARDEN CITY, N Y,—Entire sales of the Curtiss Robin cabin plane, manufactured by the Curtiss-Robertson Airplane Manufacturing Co., St. Louis, will be handled by the Curtiss Flying Service, it is announced.

Parks Company Plans Production

Cabin Monoplanes to be Built by $2,000,000 Firm in St. Louis

ST LOUIS, MO—Parks Aircraft, Inc., a $2 000,000 concern, to be located at Parks Airport, near East St. Louis, will begin production of a cabin monoplane about January 1, according to an announcement by Russell F Gardner Jr, president of the Gardner Motor Co and chairman of the board of Parks Aircraft, Inc

Construction of a modern factory, to cost $175 000, was started at Parks Airport the week of Oct 1 The plant will cover an area 500 by 100 ft. About 300 workmen will be employed, the majority being recruited from the Parks Air College and Mechanics School, which now have an enrollment of more than 200

Two models of the monoplane, which so far has not been named are under construction at the field and will be tested in flight about November 1 Details of design for the new monoplane were supplied by Oliver L Parks, vice president and general manager of Parks Air Lines, Amos O Payne formerly with the Swallow Airplane Manufacturing Co and Richard F Hardin, former naval officer and designer. While not officially announced, it is expected the new Lycoming air cooled engine will be used in the plane, which will have room for four passengers and a pilot

Mammen is President

Officers of Parks Aircraft, Inc, in addition to Russell E Gardner, Jr, are Harry P Mammen, president of Parks Air Lines, president; Oliver L. Parks, vice president and general manager, and Fred W Gardner, vice president of the Gardner Motor Co, executive vice president Directors in addition to the officers named include Oliver A. Anderson, investment St Louis broker, and Thomas Reyburn, an officer of the Gardner Motor Co and Parks Air craft, Inc, Russell Gardner and Payne and Hardin have been retained by the company to handle design and production

The company has been incorporated under the laws of Delaware with $2 000 000 capital The name Parks Aircraft, Inc, it is understood takes the place of the name Sunbeam Aircraft, Inc, formerly announced.

Consolidateds for Boeing 80

NEW YORK, N Y.—Exclusive use of Consolidated (Jones) Tachometers on the Boeing tri-engined transport Model 80, is announced here. Consolidated Panel A, consisting of altimeter, tachometer, oil pressure gauge, and oil thermometer, has also been fitted in the General plane for the Byrd Expedition

MachineToolMaterial NewG.E.Development

SCHENECTADY N Y—A new machine tool material which it is believed will make possible commercial operation involving the non-machinable class of metals, has been developed in the research laboratories of the General Electric Co. according to a paper read by Dr Samuel L. Hoyt at the annual convention of the American Society for Steel Treating held October 11 in Philadelphia "Carboloy," as the new material is called is composed of tungsten carbide and cobalt the carbide contributing the hardness and the cobalt giving the necessary strength for cutting tool use

The commercial introduction of Carboloy will make it possible to perform such operations as cutting a screw thread on a glass rod boring a smooth hole in a concrete block, turning porcelain on a lathe and cutting the hardest steels known, according to Dr Hoyt. Materials which wear down the edge of cutting tools rapidly can be machined easily with Carboloy A further advantage is the elimination of the taper caused by the gradual wearing down of the cutting tool in machine work

Quick Company Plans To Build Monoplanes

WICHITA KAN—With reorganization of the Quick Manufacturing company of Wichita, intimation has been given by the new officers that a seventh aircraft manufacturing company soon will be in operation in Wichita A new type of monoplane is contemplated. The new Quick company also plans to build its own engine

New officers of the company are Charles E Quick president Thomas E Quick, vice president and G B Winstead secretary treasurer, In addition to the officers the board of directors includes G Curtis Quick and H Spencer Quick The new company is incorporated under the laws of the state of Kansas

The four Quick brothers are fliers of experience, mechanics, and airplane engine designers

Woodward Orders Loening

LE ROY N. Y—Donald Woodward, president of the D W Flying Service and owner of the Woodward Airport here which is about to be opened, has ordered one of the new series Loening Cabin Amphibians The craft is to be powered by a 500 hp Pratt & Whitney Hornet engine

Open New Vanadium Office

PITTSBURGH, PA—An office has been opened here at 2245-2246 Henry W, Oliver Building, by the Vanadium Corporation of America, New York City The branch is under the direction of J Alfred Miller, Jr general manager of sales of the Vanadium concern

Mexican Firm Buys Cessnas

WICHITA, KAN—Three Cessna cantilever monoplanes it is reported here, have been delivered to the Rapid Transit Co. of Mexico City The craft are powered with Anzani engines Air lines are operated out of Mexico City to all important industrial centers of that section by the Rapid Transit Co., according to the announcement.

Form New Propeller Firm at Grand Forks

GRAND FORKS, N D.—Incorporation of the Master Aeronautical Corp has just been completed for the manufacture of the Master propeller for use on all types of airplane engines. The concern is now equipping a new factory in Grand Forks. The company will also handle airplane accessories

Officers of the corporation are George B Reynolds, president and general manager, Hubert Rueschenberg, vice president and treasurer, and Richard R Hopkins, secretary.

The three men turned out a number of the new type of propellers prior to incorporating, and three planes now flying from the Grand Forks airport as well as a plane used by the Morris Aircraft Co., Morris, Minn, are using this propeller, it is reported

Black & Decker Show Tools

TOWSON, MD—To further acquaint its distributors with the many applications and uses for portable electric tools Black & Decker Manufacturing Co here has held working demonstrations in practically every one of the larger cities in the country At these clinics were demonstrated the complete line of portable electric drills, hammers, screw drivers tappers, valve refacers and attachments.

Orders 20,000 OX Pistons

LOS ANGELES, CALIF—Nicholas Beazley Airplane Co., of Marshall Mo., is reported to have placed an order for $33-000 worth of OX-5 engine pistons with W B Huber & Co., here. This order covers the manufacture of approximately 20 000 pistons

Los Angeles Uses Prestone

LAKEHURST, N J—Announcement is made that Eveready Prestone, an anti freeze solution manufactured by the National Carbon Co, Inc., Cleveland, O, makers of Eveready flashlights, is being used in the water cooled engines of the dirigible Los Angeles

America First in Aviation Records

Takes Lead from Germany According to Latest N. A. A. Figures

WASHINGTON, D C—According to the National Aeronautic Association, American has taken first place from Germany in the record book of aviation With the 1928 season, American fliers hold 34 world records, Germany 32 France 20, Italy 7, Great Britain 5, Czecho Slovakia 3, Hungary and Switzerland 3 each, and Belgium 1 The United States, Germany and Italy divide honors for the three most important records—altitude, duration and speed.

At the close of the 1927 season the United States held 19 records. Germany 25, France 22, Italy 11, Czecho-Slovakia 3 Great Britain 2, and Hungary and Sweden 1 each

Richard Wagner of Germany, in a Dornier Soperwal, carried off the greatest honors of the year by establishing 12 individual world records Lieut. A W Gordon and Chief Boatswain E E Reber, U S N added five records to the list with a PN-12 plane carrying loads

The most important records established in 1928 were those of duration, set by Ristics and Zimmerman, Germans, distance on a closed circuit by Ferrerin and Del Prete, Italian airmen speed, by Major de Bernardi Italian, and duration with a 2 000 kg pay load, by Gordon and Reber, U S N

The altitude record of 38 418 ft established over Washington last year by Lieut C C Champion U S N, went unbroken this year

Boone Named to Committee

SAN FRANCISCO CALIF — Appointment of Andrew R Boone, AVIATION correspondent at San Diego, to the Statewide Aeronautical Committee of the California Development Association has been announced by Norman H Sloane manager of the association The appointment was made by Pres William M Garland. The association is a statewide chamber of commerce and its aeronautical committee has been largely responsible for development of airports within the state Its next meeting will be held at San Francisco October 18-19

Bellanca Built for Peru

NEW CASTLE, DEL—A special Model CH Bellanca with a 200 gal cabin fuel tank, has been completed at the plant here and will shortly be shipped to Lima, Peru. Javier Espejo chief inspector of the Peruvian Air Service, has spent some weeks at the Bellanca factory, having come to this country in the commission of his government to obtain the monoplane

Trade Tips

WASHINGTON, D C—Twenty-five cities have announced their intention of building airports. They are: Jasper, Ala; Sheffield, Ala; Beaumont, Calif; San Diego, Calif; Fort Collins, Colo; Telluride, Colo; Belvidere Ill; Evanston, Ill; Anderson, Ind; Indianapolis, Ind; Washington, Ia; Winfield, La; Grand Rapids, Mich; Hannibal, Mo; Crete Neb; New Rockford, N D; Columbus O; Huntington, Pa; Martin, Tenn; Menard, Tex; Rutland Vt; Abingdon, Va; Brookneal, Va; and Charleston, W Va.

MIAMI, FLA.—Blueprints are being made for the proposed new $15 000 airplane hangar at the municipal airport, and bids will be called for after approval of the plans by Wilton A. Snow, city manager. The hangar is to be 80 by 100 ft, with shop space along one side, according to present intentions.

STREVELL, IDA—A beacon and border lights will be installed at an intermediate field to be known as Site No. 10, on the Salt Lake-Pasco route. G. R. Fitzgerald, airways extension superintendent, filed application for the tract, which is owned by Cassia County near Strevell. The lease is for five years.

NEW YORK, N Y—Crescent Aircraft Corp., of which O. J. Webster, 200 Broadway, New York City, is president, has plans for the construction of a brick and steel airplane factory at Droyers Point, near Jersey City, N J, to cost about $250 000.

HAMPTON, VA—A 65 acre tract has been acquired near here by the Dixie Aircraft Corp., of which R S Skinner, Lynchburg, Va., is president. The firm will erect an assembly plant and airport to cost $60,000, it is reported.

WILLARD, O—The Willard Airport Co has been granted incorporation papers to conduct an airport here and to transport passengers and freight by plane. Incorporators are Logala Hoole, R C Blakr-Marvin and Mabel Blake-Marvin.

MEMPHIS, TENN—Plans for a clubhouse to cost about $10,000 are being prepared by the Memphis Aero Club here. The structure is to be erected on Hollyford Road.

NEW ROCHELLE, N Y—Leo Asrons, 55 Sutton Manor, this city, is in the market for a plane for private use, it is reported. No particulars as to price or type of plane desired have been given.

HELENA, MONT—Helena Airways and Flying School, Inc, of this city, has plans completed for the erection of a hangar and shop at the local airport.

Plan Itinerant Flying School

OMAHA, NEB — Francis "Chief" Bowhan has come to this city to confer with the Pioneer Rubber Co concerning the establishment of a chain flying school next spring. A Cessna plane has been purchased by the Pioneer Company, and Bowhan is planning to give instruction through Nebraska and later Iowa. "We are going to operate like the dentists before the railway came to this section," said Bowhan. "Two days a week will be spent in one town and three in another, just according to demand."

Hall Company Starts Factory at Pasadena

PASADENA, CALIF—Work has been started on the erection of a new $1 000 000 airplane factory at Pasadena, according to the announcement of Charles S. Hall, president of the Hall Engineering and Aircraft Construction Co., which plans to occupy the factory building when it is completed. The factory is to be located on five acres of an 80 acre tract lying between Duarte and El Monte Roads about three Miles east of Pasadena. The remainder of the land will be developed as the Pasadena Airport by the Pasadena Airport and Transportation company, Hall said.

The Hall Engineering and Aircraft Construction Co., plans to build a tri-engined cabin plane for the proposed flight from London to Los Angeles of Capt. Harry Lyon, navigator of the Southern Cross on its flight to Australia. A new type single engined cabin plane is also being designed by this firm.

Pawtucket Meet Under Way

PAWTUCKET, R I—A military air meet under the direction of the National Guard Association of Rhode Island is now (October 12-14) underway at What Cheer Airport here. Air races, parachute jumps, acrobatics, bombing, etc, are among the events.

A night bombing attack upon Providence was scheduled October 12. The large planes were to fly to a point above the State House while the anti-aircraft battalion swept the skies with its 1 000 000 candlepower searchlight and fired upon the "invaders."

Coast Firm Adds Fokker

LOS ANGELES, CALIF—A new Super-Universal Fokker has been added to the fleet of the Aero Corporation of California, according to Fred Hattoon, advertising manager.

Reviews

National Advisory Committee for Aeronautics Report No. 290 Water Pressure Distribution on a Seaplane Float, by F L Thompson

Tests were made on the distribution and magnitude of water pressures over the bottom of a Navy UO-1 seaplane. The tests were made by the National Advisory Committee for Aeronautics at the request of Bureau of Aeronautics Navy Department, for the purpose of determining water pressures likely to be experienced on seaplane hulls in service. It consisted in the development and construction of apparatus for recording water pressures lasting one one-hundredth second or longer on a UO-1 seaplane float under various conditions of taxying, taking off, and landing.

The apparatus consisted of a number of pistons installed in the bottom of the float. The pistons were mounted in units of four each and there were 15 of these units all connected to the recording apparatus in the cockpit. It was found that the apparatus operated with satisfactory accuracy and is suitable for flight tests on other seaplanes. The equipment is described in detail.

The tests showed that on the UO-1 maximum pressures of 6 5 lb per sq in occur at the step for the full width of the hull bottom. Proceeding from the step, the maximum pressures decrease in magnitude uniformly toward the bow, and the region of highest pressure narrows toward the keel. Immediately behind the step the maximum pressures are very small but increase in magnitude toward the stern where they reach a value of about 5 lb per sq in. There are large portions of the float bottom, both aft and forward of the step, on which the water pressures are never likely to be greater than 2 or 3 lb per sq in.

* * *

National Advisory Committee for Aeronautics Technical Notes No. 292 The Drag of A J-5 Radial Aircooled Engine. By Fred E. Weik, Langley Memorial Aeronautical Laboratory

A full size Wright Whirlwind J-5 engine was mounted on a cabin type airplane fuselage in the 20-ft. Propeller Research tunnel of the N A C A. It was tested at 60 and 100 m p h, using three different types of exhaust stacks; short individual stacks, a circular section collector ring and a streamline section collector ring. The results show that the resistance was slightly less with either the round or streamline collector rings than with the short individual stacks. The streamline collector ring, although having a fair strut section and only two-thirds the projected area of the round section, had the same drag. This is explained by the fact that both rings are behind the engine, where they apparently affect the drag very little one way or another. At 100 m p h the drag due to the engine was found to be 85 lb with individual stacks and 83 lb with each of the collector rings. At 60 m p h similar results were obtained.

AIRPORTS AND AIRLINES

Hancock Establishes New California Line

SANTA MARIA, CALIF—A commercial airplane line serving the towns of Santa Barbara, Santa Maria and San Luis Obispo, Calif, has been organized by G Allan Hancock, backer of the Southern Cross on its flight to Australia according to the announcement of Raymond W Stevens, the financier's attorney.

The headquarters for Hancock's new air line will be at Santa Maria, about 75 mi. north of Santa Barbara, and the organization will be known as the Santa Maria Air Lines, Inc. Buhl cabin planes are to be used for passenger carrying on the new routes and in taxi service from the three towns served.

Two new hangars are to be erected at the Santa Maria field, high power lines removed, a complete machine shop installed, and all equipment for night flying, including a 15,000,000 candlepower floodlight. Red boundary and obstruction marker lights will also be placed on the field. A student instruction service will be operated at the terminal field.

M R. Bellman has been named as field superintendent Lieut Hallock Rouse, chief pilot, and C. M Smith, chief mechanic.

New Packard Hangar Is Nearly Completed

DETROIT MICH—The Packard Flying Service operating at Packard Field here, has nearly completed a new 177 by 60 steel hangar, it was announced recently by H C Hartung and Pat Touhey, partners in the service.

The new hangar, Hartung said, will be capable of housing 20 places. It will be the third hangar erected on the field the other two being used by the Michigan State Aviation School, whose flying instruction is taken care of by the Packard Flying Service.

Plan Airport for Frederick

FREDERICK OKLA—Work on an airport for Frederick will be started this fall, E. E Napper, secretary of the chamber of commerce, has announced. Plans are being considered to establish the landing field on city property near the municipal lake and park north of Frederick.

Announce New Mail Stops

WASHINGTON, D C—Announcement is made by the Post Office Department that Des Moines, Ia., is now a regular stop on the eastbound transcontinental route. It is also stated that effective October 15, San Jose, Calif, will become a stop on C. A. M 8.

Air Lines Had Least Fatalities

WASHINGTON D C—A report has been issued here with a tabulation of civil air accidents for the period January-June 1928. In this half year 390 persons lost their lives and 276 were injured. In scheduled flying over air routes, however, there were only six fatal accidents, four pilots and two pasengers being killed.

Robertson Moves to New Office Building

ST LOUIS, MO—The first unit of the extensive expansion program is now complete with the removal of the Robertson Aircraft Corp into its new $25,000 office building on Lambert Field. Immediately to the side of the structure is a newly completed $75 000 hangar.

On the old site of the aircraft company, the structures are being torn down to make way for new brick buildings and hangars which will hold the Robertson Flying School, and a depot for passengers.

The office building is a two-story buff brick structure, finished interiorly with walnut and hardwood floors. The hangar, 100 by 240 ft, will contain repair and overhaul shops and a parts department. It is a steel and concrete finished building heated by oil. It also contains two 12 000 gal gas tanks which will take care of the 10,000 gal. average monthly consumption.

Ticket Office Established

NEW YORK, N Y—Formation of a consolidated air ticket office by Air Associates Inc, this city, is announced. Information and bookings to all parts of the country are now cared for at the Air Associates offices 35 Fifth Ave. Special trips may be arranged by aerial taxi, while service on airways of foreign countries may also be cared for at the local headquarters.

To Resume Ship-Shore Line

WASHINGTON, D C—Resumption of the French Line ship-to-shore air mail service is planned with the sailing of the Steamship Ile de France from New York on October 19 according to a recent announcement by the Post Office Department. The Ile de France left La Havre October 10.

Good Will Tour Started in South

New Orleans Newspaper and Aero Firm Sponsor "Aerocade"

NEW ORLEANS, LA—A tri-state "Aerocade," sponsored by the Menefee Airways and the New Orleans *Item-Tribune*, assisted by civic organizations of the city, started on a good will tour Tuesday, October 9, from this city and was scheduled to return here October 12, after flights through this state, Mississippi and Texas. Passengers taking part in the tour are leaders in industry, the Mayor and other

Executive committee of the "Aerocade" showing, left to right, Clark Salmen Bob Bauman, A T Schwartz, W S Gordon, T Semmes Walmsley, J C Menefee and J R Wedell

city officials being among the number. R. F "Bob" Bauman was managing director of the tour, which is intended to encourage aviation throughout this section.

Among the planes making up the "Aerocade" were two Lincoln-Pages, a Travel Air, and a Ryan, entered by Menefee Airways, a Swallow entered by Shreveport Airways, Waco, Lutcher Stark, Travel Air, John Sellers, Lockheed Vega, Standard Oil Co; Monocoupe, R C Holley, three Army planes, Eaglerock, the Department of Commerce and by Huff Daland Dusters and Southern Dusters, three planes understood to be Keystones.

The Itinerary

The itinerary follows: October 9—New Orleans, Bogalusa, Hattiesburg, Miss, Laurel Miss., Jackson, Miss. October 10—Tallulah, Monroe, Rusten, Shreveport. October 11—Mansfield, Natchitoches, Orange Tex. October 12—Crowley, Baton Rouge, and back to the starting point at New Orleans.

Big Meet Opens Bellanca Airport

Thousands Witness Events in Which 85 Planes Participate

NEW CASTLE, DEL—With many thousands attending, Wilmington Airport, Bellanca Field, was officially opened here October 6, with a total of 85 planes participating in the races, formation flying, bombing, exhibitions, and other events scheduled. Cash prizes and medals totalling $5,000 were distributed to contest winners.

The meet was held under the sanction of the N. A. A., and under the rules of the Federation Aeronautique Internationale, with the Wilmington chapter of the N A A, and the Wilmington Chamber of Commerce sponsoring the show. T. T. Hildebrandt was field marshal, Carl Schory and Henry B du Pont, referees, F A Wardenburg head timekeeper, Louis Meister, announcer, and Herbert G. Fales, clerk of the course.

Bombing With Flour

Formation flying by nine Liberty powered Keystone Pirate bombers, exhibition flying by Al Williams, Maj. Temple Joyce, and others parachute jumping to a mark, and bombing of the white circle in the center of the field were features. In the latter contest, sacks of flour were substituted for bombs.

Crowds filled bleachers near the Bellanca plant and were kept informed of all events through a radio announcing system. William P MacCracken Charles S "Casey" Jones, and many other well known men were present as well as well known planes, such as the Travel Air Aloha, which Martin Jensen flew to Hawaii in the Dole Race. During the day many visitors were shown through the new Bellanca plant, which is now on a regular production schedule. Here, Bellanca planes were on exhibition.

A 10 mi. triangular closed race course was laid out with the starting and finishing pylon immediately in front of the bleachers. A summary of the races follows

Kreider Wins OX-5 Race

Forty Mile OX-5 Race, nine planes competing, won by A. H. Kreider flying a Challenger plane; elapsed time, 22 min 98 sec., average speed, 104 04 m. p. h. Second, J. S. Charles flying an Eaglerock, elapsed time, 23 min 3? sec., average speed, 102 6 m. p. h.

Forty Mile Training Plane Race four planes competing, won by Lieutenant Clark in a Keystone Pup, elapsed time, 21 min, 25 sec; average speed, 112 m. p. h.

Forty Mile Whirlwind Commercial Plane Race, eight planes competing, won by Ken Unger flying a Travel Air, elapsed time, 17 min. 24 sec., average speed, 137 9 m p h. Second, T. A. Wells, in a Travel Air, elapsed time, 17 min. 50 sec.; average speed, 134 47 m. p. h.

Wasp powered Vought Corsair Race, won by Lieutenant Soucek, four planes competing, Curtiss D 12 powered Marine Curtiss Hawk Race, won by Lieutenant Sanderson, three planes competing, Army Curtiss Hawk Race, won by Lieutenant Gehlbach, six planes competing, and National Guard Curtiss Falcon Race, won by Major Owens, four planes competing

To Start Work On New Lines

WASHINGTON, D C—Contracts are to be let and construction is to begin on four new airway sections, surveys of which have just been completed, according to an announcement here by the Aeronautics Branch. These sections are: Portland to Seattle on the San Francisco Seattle Airway, Salt Lake to Burley on the Salt Lake-Pasco route, Lafayette to Chicago on the Cincinnati-Chicago Airway, and the Evansville to Terre Haute section of the Atlanta-Chicago Airway.

It is announced, furthermore, that the Lexington-Omaha section of the Transcontinental Airway is being re-surveyed.

Quarantine Planes at Border

LOS ANGELES, CALIF.—A plant quarantine inspection service covering all air lines which cross the California Border has been organized by G H Hecke, director of agriculture for the state Operating companies affected by this inspection are Standard Air Lines, West Coast Air Transport, and Maddux Air Lines During the month of September, 43 airplanes carrying 153 passengers were inspected by quarantine officers on the Mexican Border alone

Hartford District Mail Grows

HARTFORD CONN.—Steady growth in air mail traffic is being noted at a Hartford and vicinity According to District Manager G K Murphy of the Colonial Air Transport Inc Holyoke Westfield, Springfield, and Northampton, Mass., are growing at a very high rate in the use of air mail and their pouches make up much of the weight of these loads carried from Hartford.

Navy Plans Dirigible Hangar

WASHINGTON, D C—Plans for a hangar to house one of the two new dirigibles soon to be contracted for by the Navy Department, were announced recently by Secretary of the Navy Wilbur. The hangar is to be somewhat similar to the one in Lakehurst, N J

Corvallis, Ore., Field Dedicated With Meet

CORVALLIS, ORE.—The air circus with which the Corvallis American Legion Post dedicated its new airport recently was declared by participating fliers to be one of the best. About 22 planes took part.

Winners of the events were OX-5 race, 45 mi.—Fred Sauers, Vancouver, Wash., Travel Air, first Bev Clark, Portland, Travel Air, second, Tex Rankin, Portland, Waco, third.

Balloon strafing—Eddie Garbutt Portland American Eagle, first, Tex Rankin, second

Free-for-all race, 18 mi—Tex Rankin, first, Bev Clark second, Fred Sauers, third

Stunting—Tex Rankin, first, Al French, Portland, Eaglerock, second, Charles Langmack, third

Relay Race—Al Davis, Portland, American Eagle, and Bev Clark, first, C. C. Graul, Vancouver, Wash., and Tex Rankin, both Wacos, second

OX-5 special race, 20 mi—Fred Sauers, first, Dick Rankin, Waco, second, C C Graul third.

Fares are Reduced On Robertson Lines

ST LOUIS, MO—The Robertson Aircraft Corp. which operates Ford planes between St. Louis and Chicago daily except Sunday announces a reduction in rates Henceforth, one way fare between the two cities will be $30 instead of $40 and round trip fare will be $55 instead of $75 A proportionate reduction also has been made in the fare from Springfield and Peoria to St Louis and Chicago The plane for Chicago leaves Lambert Field at 9 A M, arriving at the Municipal Field at Chicago at noon. Departure from Chicago is at 3 P M., arriving here three hours later

Fly Stanolind to Kalamazoo

KALAMAZOO, MICH—The Standard Oil Co's Ford plane Stanolind recently spent two days at Lindbergh Field, Kalamazoo, carrying city, county, and airport officials The plane was then flown to Grand Rapids, where it remained on display in Jack Byrne's hangar for a time and later carried officials of that city for rides A total of 96 passengers were carried at Kalamazoo and 80 at Grand Rapids.

To Survey New Orleans Site

NEW ORLEANS, LA.—An expert will shortly be sent to New Orleans by the Aeronautics Branch to make a survey of the proposed lake shore airport here. Facilities for both land and seaplanes will be provided at the new field, according to plans

AVIATION
October 13, 1928

Plan to Light Standard Oil Beacon at Portland

PORTLAND, ORE—Three days after the Richfield Oil company flashed on its great beacon sign on Healy Heights in Portland, W L Muncy, district sales manager for the Standard Oil Co, announced that his company's 30,000,000 candlepower aviation beacon would be turned on October 14 The Standard Oil beacon is being set up on the observation tower of Council Crest Amusement Park, one of the highest points in the city The light will be about 1,280 ft. above the business district

Standard beacons at San Diego, Calif., and Seattle, Wash., will be turned on at the same time, completing the company's chain of five along the coast.

The Portland tower will bear the letters "S. O," for Standard of Oregon, on its sides. The letter will be eight feet wide and 12 ft. high, outlined in Neon tubing They will flash the continental code for "S O" The beacon will be turned on at sunset and turned off at sunrise by an astronomical clock

Robertson Provides Servicing at Lambert

ST LOUIS, MO—A servicing station has been installed by the Robertson Aircraft Corp here on Lambert Field for transient fliers which is complete in every respect. A unique feature of this service is an oil truck, used to service airplanes on the field, which not only carries 450 gallons of gas but also water, oil and air

An expert engine and airplane mechanic is maintained especially to give service to transient fliers. A full line of maps and latest information about weather conditions can be had here by the tourists of air, the Robertson company itself making great use of the weather reports due to transport of air mail in and out of St Louis

Toledo Display Attracts

TOLEDO, O—An aviation display placed recently in a local bank window by the American Air Transport Co of this city after its plane, "Toledo Leadership" completed a tour around the country created considerable interest and drew newspaper stories A huge board showed the air fare and freight rates to every city of over 50,000 population in the country

Navy Lists Miami Beacon

MIAMI, FLA.—The revolving beacon at the municipal airport, Gratigny and LeJeune Roads has been designated by the Hydrographic Office United States Navy as an official mariners' and aviators' light and has been placed on the marine maps The beacon is of 3,800,000 candlepower and revolves six times per minute

Linked to Mexico

Capt B B Lipsner (left) and Señor Lupsian (right) representing Chicago and Mexico City at inauguration of U S-Mexico air mail line

Traffic Increases On Standard Air Lines

TUCSON ARIZ—A 25 per cent. increase in passenger traffic over the Standard Air Lines Tucson-Phoenix-Los Angeles route has resulted since the resumption of the winter schedule according to the report of Paul Wall traffic manager

The new winter schedule allows coast-bound passengers time to make connections with the San Francisco planes that have been placed on an afternoon schedule by the Western Air Express The 900 mi journey between Tucson and San Francisco can now be made in one day by using the Standard Air Lines to Los Angeles and the Western Air Express to San Francisco This is a saving of a day and a night over any other means of transportation between these points and permits passengers to breakfast in Tucson, lunch in Los Angeles and dine in San Francisco

Dunn Field Firm Opens Office

LONGMEADOW, MASS—Northeastern Aircraft Corp. of Dunn Field Longmeadow has opened offices at Chestnut and Worthington Sts, Springfield which will be the business headquarters of the concern

Guardsmen at Fisk Park

HOLYOKE, MASS—Fisk Park Airport entertained a group of pilots of the Connecticut National Guard Squadron Sunday October 7 The fliers staged bombing, stunting, and other exhibitions.

Report Banner Month at Mills

September Volume Showed Five Fold Gain Over Last Year

SAN FRANCISCO, CALIF—Reports for September show that month to be the banner period in the history of Mills Field the municipal airport here. There were 2,006 flights and landings of planes coming from and destined for all parts of the United States with a total of 3,941 passengers a gain of more than 500 per cent over the same month last year The total of flights and landings since Mills Field was established in May, 1927 is 16,489, with 20,080 passengers

During September the board of supervisors appropriated $55,000 for a new runway and drainage system at the airport and approved a bond issue for $1,700,000 to finance a large airport expansion program. The measure will be submitted to the voters at the November election A campaign of education in advocacy of the bond issue has been launched by the airport committee of the board, consisting of Supervisors Milo F Kent, Andrew J Gallagher and Frank J McGovern

Receipts from rentals at Mills Field during September totaled $1,763. Supervisor Kent, chairman of the airport committee states that business at Mills Field has increased so steadily that he expects the enterprise to operate on a self-sustaining basis within a few months.

W.C.A.T. Carried 903 Persons in September

PORTLAND ORE.—Bach air yachts in regular service of the West Coast Air Transport company carried 903 passengers during September according to the monthly statistical report of the company The two planes on regular runs flew 26,326 mi. Total flying time was 240 hr This was accomplished without accident and with but one forced landing caused by thick weather

The September total brings the number of pay passengers carried since inauguration of service by the company on March 5, up to 4,933 Total miles flown runs up to 145,846.

Permits Cities to Buy Fields

ROSEBURG, ORE—Purchase of airports by Oregon municipalities was declared entirely within their constitutional rights by Circuit Judge J W Hamilton in a decision handed down here on October 2 in the case of L E Clintock against the City of Roseburg The case was filed in order to test the validity of a $25,000 bond issue voted by Roseburg last June for the purpose of purchasing and improving an airport

Detroit, Wayne To Have Fields

Locations Selected by City And County for Proposed Airports

DETROIT, MICH.—Both the City of Detroit and the County of Wayne have finally selected sites for a city and a county airport. The city airport will be located in the northeast section of the city, approximately six miles by automobile from the heart of town. If an enlargement project to be voted upon in the election November 6 receives the approval of the people, the port will consist of 395 acres, and, fully equipped, will be valued at approximately $11,000,000.

The County of Wayne, on the other hand, has been authorized to spend $2,000,000 on the acquisition of an airport. Although it was argued by several interested parties that the entire $2,000,000 was meant to go toward the purchase of property alone, the board plans on using part of the $2,000,000 appropriation in developing the site into a modern airport.

The City of Detroit now owns 249 acres, arranged in an L shaped strip on the site. This property valued at $6,000,000, has been definitely selected as the municipal airport. In the November 6 election the people are being asked to favor a bond issue of $5,000,000 to be used to condemn and purchase 146 additional and adjacent acres, and also to equip the entire airport. Practically all of the additional acreage, if it is acquired, will be located along one side of one arm of the L shaped property now owned, making the airport square shaped, with an extension 300 ft. wide, from one corner.

Plan A-1-A Rating

Twenty-three of the additional acres, expected to be acquired, now are owned by the Detroit City Gas Co. The acquisition of the gas company's property alone, it is pointed out, will be sufficient to make the airport correspond to the A-1-A standards. Even though the bond issue fails to pass, it is probable the city will find other means to acquire at least the 23 acres needed to make the site an A-1-A port. The main municipal airport site was selected upon the recommendation of Perry A. Fellows, city engineer.

The proposed site for the county airport tract is a piece of land one mile square located at the junction of Middlebelt and Goddard Roads, 16½ mi. west of Detroit.

Both fields planned are expected to be in operation within the next year.

New Stinson School Opens

TOLEDO, O.—A branch of the Jack Stinson School of Aviation in Detroit has been opened here and nearly 50 students have been enrolled.

Report Average Miles to Fields

WASHINGTON, D. C.—Approximately 3.09 mi. is the average distance from the business centers of cities in the United States to their airports, according to a recent compilation by the Aeronautics Branch, Department of Commerce, in which 436 cities were considered. The distances were found to vary from as low as one-quarter mile to as much as 18 mi.

Offices in Washington Opened by Two Firms

WASHINGTON, D. C.—Opening of the headquarters in this city by the National Transport, which operates two sections of the transcontinental air mail line from New York to San Francisco, and the Transcontinental Air Transport, now planning an extensive passenger and commercial service, was announced here today.

Headquarters for both organizations have been opened at the Carlton Hotel and both will be under the general direction of Col. Paul Henderson, former Assistant Postmaster General in charge of air mail.

The establishment of these headquarters arranged through Clem W. Gerson, manager of the Carlton Hotel adds two more prominent commercial aviation organizations to the list of companies which have opened headquarters which includes the Keystone Aircraft Co., Sikorsky Manufacturing Co., Pitcairn Aviation Co., Boeing Transport Co., Chance Vought Manufacturing Co. Wright Aeronautical Co., and Pratt & Whitney Aircraft Co.

Ask $2,750,000 for Field

NEW YORK, N. Y.—Recommendations drawn up under the supervision of Clarence D. Chamberlin, City Aeronautical engineer, for the expenditure of $2,750,000 on the development of Floyd Bennett Field, Barren Island, were placed before the Board of Estimate recently by Dock Commissioner Michael Cosgrove. Chamberlin is now on a tour of Europe where he will study the various aviation centers there.

Texas Club to Show Models

BEAUMONT, TEX.—An exhibition of model airplanes and airports, together with photographs and literature concerning military and commercial airplanes, will be maintained by the Beaumont Aero Club at the South Texas State Fair to be held here November 8-19. The exhibit will be held for the purpose of building up the airmindedness of the people of East Texas.

Plan to Have Testing Equipment at Oakland

OAKLAND, CALIF.—Plans for the establishment of a complete aircraft proving ground at Oakland Airport have been announced by L. S. Nagle, president of the Oakland chapter of the National Aeronautic Association.

The plan of the local aeronautical body to create such a field here has been heartily endorsed by the Board of Port Commissioners, which in turn agreed to purchase all of the instruments and timing devices needed, which could be used on the airport proper.

The pylons off the field and the surveying costs on the courses which are not on the airport, will be borne by the local N. A. A. group.

It is planned to establish F. A. I. registered and certified courses of from 3 to 25 km. in length, which will give Oakland the only proving ground on the Pacific Coast with international standing.

The local N. A. A. also plans intensive work in the schools in regard to proper education of the younger generation along aeronautical lines.

Portland Mail Volume Was High Last Month

PORTLAND, ORE.—About 100,000 pieces of air mail left Portland, either eastbound or coastwise during September, according to figures taken from postoffice records by Hal E. Nourse, local representative of Varney Air Lines, Pasco, Wash.—Salt Lake City air mail contractor. On September 25, 5,218 pieces of mail were carried, setting a new high mark for Portland.

About 60 per cent of the mail went east and the remainder coastwise by Pacific Air Transport. September's total was 141 per cent. greater than that for September of last year and more than 100 per cent. above the total for last July.

Suspends Passenger Service

NEW YORK, N. Y.—Passenger service over the New York Chicago Dallas runs of the National Air Transport Inc. was temporarily suspended recently because of the high increase in air mail volume since the reduced rates went into effect on August 1. The company stated that the service would be resumed as soon as larger planes are acquired.

Tri-City to Open Airport

WISCONSIN RAPIDS, WIS.—Tri-City Airways, Inc., Travel Air agent for 10 Wisconsin counties in this section, will officially open the new airport south of this city on October 13 and 14 if the new 80 by 100 ft. hangar is completed in time. Prizes amounting to $2,500 will be offered in various events.

FOREIGN ACTIVITIES

Winnipeg-Calgary Line Is Canadian Firm Plan

WINNIPEG, MANITOBA.—Passenger and express package transportation between this city and Calgary, Alberta, is planned by Western Canadian Airways, Ltd. of Winnipeg, according to Trade Commissioner Richards.

According to present plans the plane will make two round trips a week, leaving Winnipeg in the morning and arriving in Calgary the evening of the same day, thus saving about 14 hr. as compared with train time. The distance is about 830 mi. by air, and it is contemplated that the trip will take about eight flying hours time with a half-hour stop at Regina.

The present fare is $1.25 per mile for passengers or about $1,000 fare from Winnipeg to Calgary. Express rates are on a basis of $50 per pound for a full load with higher rate where less than a full load is carried. The plane to be used in this service is a DH biplane with a cabin body with a capacity of eight passengers. It is powered by a Bristol Jupiter engine.

Plan 1929 Show in England

LONDON, ENGLAND.—The Seventh International Aero Exhibition will be held at Olympia, Kensington W., July 16-27, 1929, it is announced here. The exposition is being jointly organized by the Society of British Aircraft Constructors, Ltd., and the Society of Motor Manufacturers & Traders, Ltd.

New Brazil Line Schedule

PELOTAS, BRAZIL.—The Compania General de Empresas Aeronauticas, Lineas Latecoere, which operates an air-water service between Buenos Aires and Paris, France with Montevideo, Uruguay, as a port of call, announces a new schedule involving night flying between Buenos Aires and Pelotas.

Plan New Line in Brazil

RIO DE JANEIRO, BRAZIL.—Daily air mail and express service is planned between São Paulo and Rio de Janeiro by the Condor Syndicate. The trip is expected to take three hours. Later a similar line is to be established by that company to Bello Horizonte.

Will Bring Autogyro to U. S.

PARIS, FRANCE.—It is reported here that Juan de la Cierva, Spanish inventor is planning to visit the United States with his Autogyro in the near future.

Record Broken By Lady Heath

CROYDON AIRPORT, ENGLAND.—Lady Heath, British aviatrix, is reported here to have reached an altitude of more than 24,000 ft. in a flight October 4 in her single place Cirrus III powered Moth plane. This is looked upon as a new world light plane altitude record as well as the highest level ever attained by a woman flier. Lady Heath stated 1 hr. 40 min. was required for the climb.

Von Langsdorff and Petersen, German fliers, were credited with a mark of 20,997 ft. at Hamburg the same day, a light plane being employed for the flight.

Plan to Open Ontario Airport November 1

HAMILTON, ONTARIO.—A large airport is to be opened here on November 1, according to Maj. Gen. J. H. MacBrien, president of the Aviation League of Canada and managing director of International Airways of Canada.

The new airdrome is being constructed through the co-operation of International and the City of Hamilton. Governor General Viscount Willingdon has consented to take the chief part in the opening ceremony which it is said will be an affair rivalling that connected with the inauguration of the international air mail service out of St. Hubert, Montreal on October 1. Many guests are expected.

Geared Jupiter Engine is Tested

Power Plant Given 150 Flying Hours in Bristol Airplane

LONDON, ENGLAND.—Tests were recently completed by the Bristol Aeroplane Co. on the new type Bristol Jupiter Series VIII geared engine the power plant having been given 150 flying hours fitted in a Bristol "Bloodhound" biplane. The trials were made with the purpose of proving out the most suitable compression ratio for a high compression geared air cooled engine and also of proving out a suitable exhaust system for this type of power plant. The compression ratio of 5.8 was finally selected.

Considerable development work was found to be necessary in regard to the exhaust ring, owing to the fact that with the 2:1 reduction gear the cooling slip stream was not as efficient as with the ungeared engine. Accordingly the area of the exhaust ring and outlet pipes had to be considerably increased and modified as compared with the ungeared engine, in order to meet the official requirements of the Fire Prevention Committee. As a result the exhaust ring area has been increased to 24.5 sq. in. and double outlet pipes have been provided for each cylinder.

It is interesting to note that with the Bloodhound machine considerable increase in performance was registered with the geared engine as compared with the direct drive power plant. For instance, at 5,000 ft. the increase in speed was over 12 m. p. h., or approximately 10 per cent.

Fokkers for Foreign Service

Eight Fokker airplanes at Schiphol Aerodrome, Holland awaiting delivery to points in Europe, Africa and Dutch East Indies.

THE BUYER'S LOG BOOK

Reliance Tachometer

A TACHOMETER specially designed for aircraft engine use is included in the instrument products manufactured by the Barbour Stockwell Co, Cambridge, Mass. This tachometer, designated Model F, is graduated from 200 to 2400 r p m and furnished with internal gear or for direct drive in 11 different types. Instruments having drive ratios of ½, 1, and 1½ to 1 are available.

Model F tachometer for aircraft

The flexible shafting used with Reliance tachometers is made up of 17 strands of music wire wound and counterwound in compact form and is positive in action. Whipcord-braided fabric casing with Reliance ball bearing type or U S Air Service standard fittings at the instrument end and right angle adapter with connection at engine end, machined U S Air Corps standard, can be supplied according to the requirements of the purchaser

Centrifugal force, operating through the medium of an evenly balanced three-weight governor, is the working principle used in Reliance tachometers. This governor controls the movement of the indicator in both directions over the dial, is noiseless in operation and responds instantly to the slightest variation in speed with smooth action of the indicator. The mechanism is simple and an automatic coupling eliminates any possibility of trouble or of locking of parts when connecting the flexible shaft or other driving member.

Reliance tachometers are also supplied in panels with other instruments.

Vellumoid Sheet Packing

SHEET PACKING made especially for gasoline, oil, and crude distillate connections is being manufactured by the Vellumoid Co, Worcester, Mass. Vellumoid, packing is a strong vegetable fibre sheet, chemically treated, and contains no rubber or rubber substitutes. It combines all of the characteristics needed in a gasket material for this type of work

Vellumoid is furnished in seven standard and two special thicknesses in rolls and sheets. The rolls are 36 in wide and the sheets 36 in by 36 in. For users preferring to purchase their gaskets ready cut according to blue prints or samples, the company operates cutting plants at Worcester and at its Detroit branch

Long life and high tensile strength are characteristic of Vellumoid and no shellac is required to be used in applying it. This packing can also be used in air, water, gasoline, oil and crude distillate flange connections where temperature does not exceed 350 deg F. It also may be used in work with a large number of organic liquids and solvents, in the retention of particularly difficult liquids such as carbon tetrachloride and for low temperature work such as the liquefaction of air in the manufacture of oxygen and the rare gases including helium

Le Blond Lathes

A COMPLETE line of lathes as well as a number of attachments for them are included in the products of the R K LeBlond Machine Tool Co of Cincinnati, O. The lathes are of rigid design and rugged construction and have a minimum of working parts and controlling levers. All parts are machined in jigs and to standard gauges and templates and each machine must pass a rigid inspection before it is shipped from the factory.

Several models and sizes of heavy duty geared head and cone driven engine lathea are included and turret lathes of the geared head or cone type are also available. The various types of crankshaft lathes produced by the company are of special interest to the engine manufacturer. The company also is in a position to furnish supplementary equipment for the complete turning operations on crankshafts. Portable lathes of various types are also made by the firm


One of the special crankshaft lathes manufactured by the Le Blond Company

Friez Weather Equipment

TWO SETS of complete weather equipment for airports are included in the products of Julien P. Friez & Sons, Baltimore, Md. Either of these sets, designated Equipment No 1 and No. 2, enable the airport operator to make accurate observations and records of all meteorological conditions

Equipment No 1 is designed for large airports and consists of a complete set of instruments which permit visual observation of all local weather conditions and records these on charts. After a short experience with weather graphs, the operator is enabled to forecast future conditions with a high degree of accuracy. Changes in direction and velocity of wind are recorded graphically on a rolled strip of paper and these conditions are also recorded on dials which may be placed at various parts of the field. Graphic records are also made of barometric pressure, humidity, temperature and rainfall and to check conditions a mercury barometer, a sling psychrometer, a maximum and minimum thermometer and a standard mercury thermometer are added

Equipment No 2 is intended for use at the average airport. It permits visual observation of all local conditions and records graphically barometric pressure and temperature. This equipment is relatively low in cost and may be used to advantage at airports where the more complete equipment is not required

Right Angle Drill

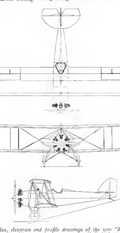
THE MIDGET close quarter right angle drill, manufactured by Charles A Koza, Rochester, N Y, fills a definite need in the aircraft factory or repair shop. By its use holes may be drilled in narrow spaces, or out of the way corners or any place where there is one inch of space

The Midget drill has one chuck and 6 ft. of ⅜ in. flexible shafting. It is designed to be used in connection with any ¼ in electric drill. The operating end is ⅞ in wide and will drill holes up to ¼ in diameter in metal or wood in a corner ½ in by ⅝ in in size. Other models are made to work in spaces up to 12 in.

The "Kitty Hawk"

(*Continued from page* 1191)

terplane and cabane struts are constructed of streamline tubing and double streamline tie rods are used in the external bracing. Wing fittings are of 1025 sheet steel bolted to the spars in such a way as to offer a minimum resistance to the wind


Plan, elevation and profile drawings of the new "Kitty Hawk" three passenger, open cockpit biplane

Access to the forward or passengers' cockpit is gained through a door in the left side of the fuselage and the cockpit is sufficiently large to permit of the removal of the gasoline tank without disturbing any part of the plane. All fuel is carried in the fuselage tank which has a total capacity of 37½ gal. The tank is constructed of welded aluminum with a horizontal baffle plate forming two separate compartments, the upper division being a 10 gal gravity tank. The tank is supported by steel straps attached to the fuselage members. A hand pump is installed in the rear cockpit for emergency use and a gauge for the main tank is placed on the instrument panel. There is also a sight gauge in the filler cap of the gravity tank. Forward of the fire wall and above the engine is located a welded aluminum oil tank having a capacity of three gallons

An Elgin instrument panel installed in the rear cockpit consists of altimeter, tachometer, oil pressure and temperature gauges, gasoline gauge and clock all mounted in a single unit. Throttle controls are provided in both cockpits and dual stick and rudder pedal control may be installed when the plane is to be used for instruction

Landing gear is of the split type and has a tread of 7 ft 4 in. It is so designed as to be easily removable for repair or replacement of parts. The axle is welded to the lower vee struts eliminating torsional strains that would occur in a bent axle. Circular rubber discs slipped over the lower ends of the compression struts, which telescope into short lengths of tubing at the bottom, are used to absorb the landing shock. Discs can be easily added or removed as desired

All empennage units are constructed of welded steel tubing, Linoiled and covered with fabric. Both elevators are made up on a common torque tube with the horn attached in the middle of the tube and inside of the fuselage. The stabilizer is in one piece and is adjustable through a range of 2 deg negative to 4 deg positive. Adjustment can be made from the rear cockpit while the plane is in flight the mechanism for this consisting of a push pull rod actuated by a lever in the cockpit

Stabilizer and fin are braced by double tie rods from the fuselage to the stabilizer spar and single rods from the stabilizer spar to that of the fin. The diagonal spar of the fin is bolted to the fuselage in such a way as to be adjustable. Ailerons and elevators are actuated by means of push pull rods and the rudder by means of cables.

The entire plane is of rugged construction and all parts subjected to greatest wear are made amply large. Load factors and other specifications are in accord with Department of Commerce requirements

Specifications furnished by the manufacturer are as follows.

Length overall	21 ft 11 in.
Height overall	8 ft 6½ in
Airfoil section	U S A 27
Span	28 ft
Chord	4 ft 6 in
Total wing area	233 4 sq ft
Stabilizer area	16 10 sq ft
Elevator area	9 25 sq ft
Fin area	4 54 sq ft
Aileron area	22 3 sq ft
Rudder area	5.25 sq ft
Weight empty	1,115 lb
Gross weight	1,888 lb
Power plant	96 hp Ryan Siemens 7
Wing loading	8 52 lb per sq ft
Power loading	19 65 lb per hp
High speed	112 m p h
Cruising speed	90 m p h
Landing speed	40 m.p h.
Gasoline capacity	37½ gal
Oil capacity	3 gal
Range at cruising speed	500 mi

Development of Aircraft Propellers

(Continued from page 1190)

ted and the empirical constants obtained for making the correct assumptions for use of the blade element theory.

These results, from an English point of view, are elaborately given in "The Design of Screw Propellers" by Henry C. Watts, published in 1920. The methods described by Henry C. Watts did not meet the full requirements of the American propeller designer. The American designers preferred to view the complete propeller whenever possible and use non-dimensional coefficients of performance in order to predict the performance.

In order to satisfy the demands for these coefficients experimental research on air propellers was conducted by the National Advisory Committee for Aeronautics, by W. F. Durand and E. P. Lesley. The results of their model

One blade and the hub of a Miarta adjustable pitch propeller

tests on various families of propellers appear in N. A. A. C. reports and the coefficient for performance were published in 1925 N. A. C. A. Report No. 141. The results of this research are extremely useful but the fact that test coefficients apply to only geometrically similar propellers constitutes a strict limitation to the use of such coefficients. It must be realized also that coefficients based on medel tests are not applicable to full scale propellers unless corrections are made to compensate for differences in tip speed and for fuselage interferences, not included in the model coefficients. In addition to this it must be realized that these models generally used the thick aerofoil sections used in the design of wooden propellers and that often the results do not agree with actual full flight test of the thin sectioned metal propeller in use today.

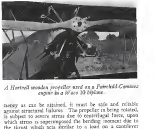
The National Advisory Committee for Aeronautics has just completed a large wind tunnel at Langley Field, Virginia, for the purpose of testing full sized propellers with the full sized fuselage and engine behind them. It is felt that this wind tunnel will give test results that can be applied directly to modern usage, yet there are so many variables that enter into aircraft propeller design that it is believed that considerable experience and engineering judgment must be used to know when and where various test data can be applied.

The Bureau of Aeronautics of the U. S. Navy designs and tests many experimental propellers each year. The purpose of these tests is to improve plane performance where possible; reduce fuel consumption and to lower propeller manufacturing costs. Both the Army and Navy design practically all of their own propellers, furnishing the contractor with a finished drawing with all dimensions. This method places the responsibility for the propeller performance squarely up to the Services.

Let us now in general terms describe the problems that are involved in aircraft propeller design. A rotating propeller offers a definite resistance to being rotated, and this resistance varies as a function of the speed of revolution. The power absorbed varies proportionally. The speed of revolution of any particular propeller will, therefore, be determined to a large extent by the power available to turn it. On the other hand each different type of engine develops its power most efficiently at some definite speed of revolution, depending on the type of engine. The propeller, in order to be considered a practical success, must be so designed that the torque caused by its resistance at this speed just equals the torque which the engine can exert to turn it. If the torque required by the propeller be either greater or less than the torque available the propeller will run slower or faster respectively until the necessary equality of torque is obtained. If this were all, the problem would be simple, but account must be taken of the fact that power required to turn the propeller depends not only on the speed of revolution but on the airspeed of the craft on which it is used. In other words, each combination of engine and aircraft will require its own particular design or changes made to already existing designs in order that the engine will have the desired speed of rotation when operated at the speed of the plane.

Now, independently of this foregoing requirement any given propeller has its maximum efficiency at a given ratio of air speed of the plane to tip speed of the propeller. It, therefore, is required that when the engine has its required r. p. m. when the plane is moving forward at its resultant speed that the propeller shall be operating under the conditions that cause its maximum efficiency. For planes that cruise at lower than maximum speed it is desirable that the propeller maximum efficiency occurs at cruising speed in order that fuel consumption will be low. In high speed fighting planes it is is desirable to have maximum efficiency at the maximum speed. So it is seen that the type of service required from a plane governs to some extent the propeller used.

In addition to the previous requirements that the propeller must fit the engine and plane and have as high an effi-



A Hartzell wooden propeller used on a Fairchild-Caminez engine in a Waco 10 biplane

ciency as can be attained, it must be safe and reliable against structural failures. The propeller in being rotated, is subject to severe stress due to centrifugal force, upon which stress is superimposed the bending moment due to the thrust which acts similar to a load on a cantilever beam. These two main stresses are further complicated in that there is a torsional stress in the blade due to the fact that the centre of gravity of any one section and the centre of pressure are not the same point. Other causes of stress in a propeller blade are bending moment due to torque and gyroscopic stresses.

In order to provide enough material to withstand these stresses the propeller designer is confronted with the problem that increase of cross sectional area or moment

of inertia alone is not sufficient, for centrifugal force is increased by the addition of material. The distribution of material in a propeller blade such that each section will be aerodynamically as good as possible, yet still have sufficient material properly distributed to make it sufficiently strong, is the eternal problem in propeller design. Until about 1923 nearly all propellers were made of wood. Up until that time the proper wood, properly put together, was the best material available. The suitability of a material for propeller manufacture depends largely on the strength/density ratio, and various experiments using different materials were tried. The most promising experiments prior to 1923 were the use of a steel covering over a wooden interior, and later, the use of aluminum and aluminum alloys. Hollow steel blade welded along the trailing edges showed promise but trouble with the weld together with the cost of manufacture failed to get this method into quantity production. However, "Micarta," a phenol product used as insulators, proved successful and is used today for certain types of propellers. In 1923 the first "Reed" slab type of propeller came into use. It was made of a slab of rolled aluminum alloy and then twisted to the desired pitch. This type was later changed, for reasons of strength, to the Reed "R" type which somewhat resembles a wooden propeller reproduced in metal.

Until about 1924 all aircraft propellers were of the fixed pitch type. That is, it was impossible except in a specially equipped shop to change the angles of the blade to fit new conditions of airspeed or revolutions per minute. The detachable blade type was the result of this restriction. This type consists of a steel hub into which are fitted the duralumin blades. The blades can be set on a plane table to any angle desired. From a standpoint of performance and cost this type has come into wide use in the Army, Navy, and commercial fields. A given design of blade will fit a larger number of conditions of flight and hence dies can be made for those blades greatly in demand, which reduces their cost. The blades are of aluminum alloy produced under the trade name of "25S." This material has a high strength density ratio, can be forged and heat treated.

Detachable Blade Type Has Many Advantages

The advantages of the detachable blade type of propeller are numerous and mainly that the same design of blade used in two and three blade combinations, together with small changes in diameter give virtually several families of propellers. Experience shows that if a detachable blade is designed of uniform pitch, but is set in the hub to operate at a lower effective pitch, that the performance is bettered. In effect the lower setting gives a propeller of non-uniform pitch, so it is a case of the pitch all along the blade fitting the actual air flow that exists. In this respect, non-uniform pitch blades, when used with the modern air-cooled engines give better results than a uniform pitch. However, for best results the setting cannot be too far above or below the designed angle as in the extreme cases some sections would be working at either too high an angle of attack while at the other extreme some sections might have negative angles of attack. Further advantage can be taken of the adjustable pitch feature in that a better climb and take-off can be attained by reducing the setting about one or two degrees from normal. The propeller, for example, is set to have its maximum efficiency at the maximum speed of the plane. This setting in this example will be called the normal setting. Now if this setting is reduced prior to take off it will permit the propeller to turn faster or "race" at full throttle. This is a dangerous practice unless the limiting r. p. m. of engine and propeller are known. However, this is often done to get off with a heavy load and then throttling down when in the air.

Another advantage of the adjustable pitch type is that in an emergency due to shortage of propeller blades the plane can be kept in the air by using a larger diameter blade and cutting it off to the correct diameter and setting it so as to give the required r. p. m. It is not maintained

An order of Curtiss-Reed slab type propellers awaiting shipment from the factory

that this gives the best propeller possible but it is often resorted to instead of keeping the plane in the hangar waiting for the arrival of the correct blade.

Some research on the effect of high tip speeds on propeller performance was conducted by Dr. Stanton at the National Physical Laboratory in England during 1926 and 1927. Tests were carried out on aerofoil sections at air speeds up to twice the velocity of sound. (The velocity of sound in air is normally from 1,080 to 1,125 ft. per sec., depending upon the temperature.) From the preliminary work it appears that the shape of the most efficient aerofoil section for use at such speeds differs considerably from that suitable for the ordinary range of tip speeds—that is, speeds below 1,080 ft. per sec. Following this preliminary investigation, studies of medel propellers (using R. A. F. 31A section) operating at various tip speeds was begun. The results of these tests show that the loss of propeller efficiency begins to occur at a tip speed of about 760 ft. per sec. and this loss is not serious until a speed of 850 ft. per sec. is reached. Beyond tip speeds of 850 ft. per sec. there is a more rapid decline in propeller efficiency and this loss is greater on propellers with thick sections than on those with thin sections.

It can be seen from the contents of the preceding paragraph that in cases where the tip speed is too high, either a three or a four-bladed propeller with the resultant smaller diameter, or gearing down the propeller must be resorted to in order to obtain the best results.

With the development in the last few years toward increasing engine horsepowers and speed of rotation, it is practically imperative that propellers be made of metal and that gearing will become more and more necessary as this development continues. With competition so keen in the commercial field of aviation and the demands for increased performance in the military branches of aviation, it is more and more important that the propeller operate at its highest efficiency yet still be safe and reliable, and at the same time be of such construction to permit of

manufacture in quantity production at as low a cost as possible consistent with quality of the product

The aim in all propeller design should be safety, high performance, and economy which closely coincide with the general aim of all aircraft products

The Slate Dirigible

(Continued from page 1189)

light the cabin Another set of two of about 10 hp are used to operate the hoists for cargo elevators and one on the water line between boiler and condenser Only 5 gal of distilled water is carried in the entire steam generating plant and but 1 gal of water is consumed in every 1000 mi of travel at approximately 100 m p h

Two kinds of fuel are used, natural gas or ordinary commercial gas and refined crude oil A perfect weight balance is thus effected whereby the gaseous fuel lifts the weight of the liquid fuel This relieves the gross lift of ship from fuel weights and gives a balancing arrangement that permits the ship to gain or loose altitude by burning one or the other fuels Any desired altitude level can be maintained by burning an equal quantity of both to secure a balance of weight

The new propulsion principle embodied in the Slate dirigible has been called the "air displacement" system It involves the displacement of the air in front of the ship the passing of the air stream to the rear and its replacement on the rear taper of the ship This is accomplished by the centrifugal blower which has a disc diameter of 58 in and an operating speed of 4,000 to 6 000 r p m The

An exterior view of the cabin of the Slate all-metal dirigible now under construction

air is sucked in from the area just ahead of the nose and thrown back along the ship's surface A partial vacuum is created ahead, inducing a suction on the ship The air stream flowing back across the rear taper fills the aperture made by the ship's passage and builds up a positive pressure at the rear which drives the ship forward

There is no vibration from the turbin The blower always has an even load pull and the slip stream travels at very high velocity averaging close to 300 m p h and extending an appreciable distance outward This protects the ship with a cushion of air from all forms of atmospheric conditions that would otherwise endanger the shell or affect perfect flying control Easy and absolute flying control is secured by the slip stream that is forced by

the contour of the ship to pass over the tail control surfaces while the adjoining atmosphere is normal

The effect of this positive guiding control is that the ship can hold a position under its own power, directly over any desired spot. While this position is maintained passengers or freight can be taken on or discharged by the unique Slate elevator. The liquid fuel tank is lowered by cable and the ship is allowed to drift back enough to bring this tank cable at about a 5 deg. angle, then the elevator is operated up and down. The elevator will always travel on the under side of this guide line and regardless of the movement of ship, the elevator, always terminates at the spot where the fuel tank rests. This spot can be a building top, a field, the deck of an ocean steamer, or a point in the mountains

Two automatic steam turbine hoists power the loading and unloading elevator system. With the ship floating free it is in no danger from sudden shifting air currents and can rise or settle or shift from side to side, but in no way affecting the elevator from continuous service. This obviates the use of landing fields or mooring masts.

Another feature is the combination balloonette. This is a gas and air tight cloth bag inserted inside the metal shell. In the lower portion air from the outside flows freely through an open passage and regulates the atmospheric pressure on inside of shell to same pressure as on outside, at all altitudes. This relieves the ship shell of any stress. The blower propulsion further relieves all driving strain so that as the ship increases speed there is only a very slight increase of skin friction from the slip stream and it is this skin friction that is evenly distributed over every square inch of shell surface that propells the ship

Passengers will have every modern accommodation for comfort including individual radio ear phones. This will provide amusement and entertainment, also the historical data of country as it is passed over, or the receiving and sending of messages to any point while in flight

A great safety factor to passengers and ship is provided by the fact that lifting gas is free inside the metal shell with no compartments and under constant pressure from the action of the balloonette bag. If the shell were punctured and the gas escaping the ship would maintain its perfect balance and fly for 100 mi. or more before slowly settling to earth. And should this gas take fire it would not be at all disastrous

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Merchandising Airplanes

(*Continued from page* 1188)

with dual controls, permitting its use for instruction purposes. The front cockpit controls could be removed when desired. At that time, the average buyer was an airport operator

With the steadily increasing number of private pilots, and the acceptance of the airplane as a means of rapid transportation by the public, the individual buyer may be almost anyone. Motion picture actors are buying and flying their own planes. Musicians, salesmen, lawyers, and doctors are among those, who are learning to fly. Those who have learned, are buying planes for their personal use

In a country, as thoroughly converted to buying on contract as the United States it is only natural that the prospective buyers would want terms. Until recently, cash was the answer. Gradually, however, the finance companies have come to recognize the advantage of handling airplane paper, and insurance companies have learned

that an airplane of approved design, flown by an experienced pilot, is not a highly perishable commodity Today, it is possible for dealers operating under a strong distributor, to get satisfactory financing at a low carrying charge Retail sales are bound to increase, when this practice becomes general

The salesmen, themselves, must be thoroughly familiar with the plane they are selling It is not absolutely essential that they be able to fly alone, but it is highly desirable that they have sufficient dual flying experience to know something about flying They should be able to talk airplanes and flying intelligently They must master the Department of Commerce Air Regulations and the Air Traffic Rules They must learn operating costs, so that they may tell the prospect what it will cost him to fly a plane. They must be able further to reconcile the airplane language of the cost of operation to the

Front quarter view of a Cessna monoplane, powered with 10 cylinder Anzani engine

usual methods of quoting costs Telling the layman, that it costs $15 an hour to fly a plane, it will strike him as being exceedingly expensive, unless the salesman takes the trouble to show him that in an hour he will travel about 100 mi and that 15 cents a mile is quite inexpensive for individual traveling

There is no mystery in selling planes No necromancy is employed It is as matter-of-fact as selling automobiles, clothing, or groceries It takes plenty of hard work and determination, and an intelligent application of the uses of the airplane to the needs of the purchaser.

Many airplane merchants today, who would like to connect with a factory-distributor-dealer organization, hesitate to do so because they feel that the commission on the sale of a single plane is too small, and that they can get more favorable discounts on a direct-from-factory-franchise. It is true that the discounts allowed by the manufacturers to their distributors are small, but even so, the dealer aligning himself with a strong factory-distributor-dealer organization has many advantages over his direct-from-factory-franchise brother, even though the latter makes a larger commission on each sale. The problems of the factory are varied, and are chiefly those pertinent to the manufacture of planes. While the sales end is not neglected, it is not possible for the factory to give close personal attention to the needs of a multitude of dealers covering a wide territory The dealer, under such an arrangement, is left more or less to his own devices He plays a lone hand In the end, he finds that his larger discount per plane is more than absorbed by his increased sales cost

The distributor, on the other hand, is concerned with the selling of planes and plane service only He is vitally interested in the success of every dealer under him His salesmen work with the dealers on their territories, and assist in closing business that might otherwise be lost The combined advertising of the distributors and dealers, in any territory, has a strong influence on the buying public The distributor knows the problems of the dealer in his particular section As a result, he is able to give

him counsel and assistance in working out plans for solving those problems. The dealers in such an organization are co-operators, rather than competitors. They exchange ideas with the distributor, and with each other. When one works out a difficult problem, he does not keep it a secret, but passes it on to his fellow-dealers. In crossing each other's territories, they stop for a visit. They become successful by helping each other.

During the past two years, the demand for new production ships has far exceeded the supply, with the result, that salesmen have been inclined to be lax in their selling methods. With the old, established factories rapidly increasing their output, and new factories coming into being and not putting their products on the market until they have a definite production schedule under way, the supply will soon catch up with the demand. Then, real selling will begin, and then, the factory with a well established distributor-dealer organization, each member of which is carrying on an aggressive sales campaign, will be able to increase its sales over its competitors, who have been content to drift with the tide, during the times when the buyer had to wait his turn for a plane. The far-sighted individuals in the industry realize that this time is rapidly approaching. They are building up their organizations for the time when real selling will have to be done. When that day arrives, the factories that have strong distributors, and who, in turn, have well-knit dealer organizations, will dominate in the field.

The retail sellers of planes—the dealers—are training their salesmen in merchandising airplanes and aviation service. The alert salesman is absorbing all data possible during this time of easy selling. He is busy also, building up contacts that will be profitable to him when he must seek the buyer, instead of having the buyer seek him.

Aviation Country Clubs

(*Continued from page* 1187)

Pynchon, Jr., and William H. Harkness are included in the membership committee.

Among perhaps some of the more prominent members of Aviation Country Clubs are Hon. William P. MacCracken, Jr., Assistant Secretary of Commerce for Aeronautics; Edward P. Warner, Assistant Secretary of the Navy for Aeronautics; Comdr. Richard E. Byrd, U. S. N. (Ret.), Cornelius Vanderbilt Whitney, and William B. Leeds.

Five types of memberships in Aviation Country Clubs, Inc., are available. These are proprietary, life, active, junior, and non-resident. The holder of any of these memberships is entitled to the privileges of all the clubs formed. The initiation fees are set by the national organization, which collects them and then turns the money over to the individual club to which the new member will be attached. The annual dues for the various types of memberships are set by the individual clubs from year to year. This money likewise is collected by the national organization, and is focused on the club with which the member is affiliated. A small percentage of the dues is retained by the national organization to defray operating expenses.

"All of the property and assets of the club, acquired and to be acquired, are vested in the proprietary memberships," says the club brochure. "The proprietary membership grants all the privileges of the club by the payment of annual dues. It is transferable for a cash consideration, by gift or bequest, to any person eligible for

membership in the club. A sound financial policy must embrace the maximum safety and investment features of these members, who, through their purchase of proprietary shares, provide the greater part of the finances necessary for the establishment of the flying club.

"The equity of these memberships will be protected by the investment of the club funds in large acreage in close proximity to the principal cities of the United States together with the improvements of such acreage by the construction thereon of club buildings, flying fields, and so forth, financed through the sale of all types of memberships, but vested entirely in the proprietary membership shares. This affords an ever increasing monetary value to a proprietary member's equity, so that in case a sale of his rights becomes advisable, or should such rights pass to his estate, his equity is more than adequately protected.

A sketch of the model clubhouse designed by Warren Shepard Matthews

"Life members have all the privileges of the club for life, and are forever exempt from all dues.

"Active members have all the privileges of life members, but shall pay such dues as are from time to time decided upon by the local Board of Managers.

"The sons and daughters of members, between the ages of 16 and 21, may be elected to junior memberships in the club. The privileges and dues of such memberships will be decided upon from time to time by the local Board of Managers.

"The national Board of Governors may elect to non-resident membership persons living outside a radius of 50 mi. of any city where a club is established. Both the initiation fee and the dues of such membership are handled by the National Treasurer to be used for the advancement of the club as a whole, and to provide a reserve fund to take care of contingencies."

The rapid establishment of Aviation Country Clubs throughout the country, it is believed, will be facilitated by obtaining a large non-resident membership. The non-resident members will act in co-operation with the national organization committee, and by this means can aid materially. An official publication is soon to be issued by the national body, which will keep the non-resident members informed as to the activities of the organization. The initiation fee, as set by the club, is $50, while the annual dues are $10.

Warren Shepard Matthews, New York architect, has drawn up plans, which are intended to serve as a model for the clubhouses constructed by the individual clubs. A sketch of the two-story structure, designed by Mr. Matthews, and the plans of the first and second floors are reproduced. One of the features of the design is the plane-like shape, which will make the clubhouses easily recognized from the air.

Black and Bigelow, Inc., air transport engineering firm of New York, has prepared an estimate of the investment required for establishing one of the individual clubs. This estimate is based on the construction of a clubhouse

according to the plans drawn up by Mr Matthews. The engineering company has prepared also a report of the annual operating cost for such a club. Particular emphasis is given the hourly cost to a member for the use of one of the club planes. The estimate and the report are being used as a basis in the formation of the first flying clubs

The information compiled by Black and Bigelow, Inc., is as follows

Investment

Club House. Construction of club house as per plans of Warren Shepard Matthews. Basement to contain heating plant. First floor to contain lounge, dining room, kitchen, office, manager's bedroom, bath, first aid room, locker room, showers, check room, chef's bedroom, service dining and bedrooms and pantry. Second floor to contain upper lounge, grill room, women's retiring room, card rooms, bar, three bedrooms with baths, observation decks. Total cost of construction as per estimate of architect 66,000 cu ft at 50c	$33,000 00
Furniture	2,141 00
Office furniture and equipment, about	450 00
Rugs and carpets	350 00
Dining room and kitchen equipment	2,970 00
Nucleus of Club Aviation Library	100 00
Electric lights, telephone, water connections	1 000 00
Architect's fee, five per cent	1,650 00
Field and Flying Equipment. 80x80x20 ft with 80x20 ft. lean to for shop, storeroom, etc. Hangar of steel construction with galvanized steel siding and roofing, concrete floors and foundation piers, one toilet and wash sink. Figures based on $2 50 sq ft, for 8,000 sq ft	20,000 00
Installation of cesspool, water, electric light, etc., about	750 00
Construction of tennis court	1,500 00
Landscaping, gravel walks, etc, about	1,500 00
Four light two-place, dual control, airplanes complete with Curtiss OX-5 engines, approximate price, delivered, $3 165 each	12 660 00
One spare OX engine, about	1 000 00
Spare parts for airplanes and engines	1 000 00
Four parachutes at $350 each	1,400 00
Fordson tractor complete with golf course wheels, rollers, mower, road drag and snow plow attachments	2,324 00
Light truck with "station wagon" body	800.00
Weather apparatus including wind cone and mast, barometer, etc.	100 00
Fire-fighting apparatus	510 00
Shop equipment, including lathe, motor, tools, etc.	1,200 00
Shop office equipment	250 00
Engineer's fees, incidentals and contingencies, about	1 745 00
Organization, New York Office and Administrative	15,600 00
Totals investment required exclusive of property	$104,000 00

Annual Operating and Maintenance Cost

Depreciation and obsolescence of club house building, five per cent, of $33 000	$1 650 00
Depreciation of hangar and shop, five per cent of $20 000	1,000 00
Depreciation of club house furnishings, 15 per cent of $6 006	901 00
Depreciation of shop and office equipment, fire extinguishers, weather apparatus, etc, 15 per cent of $2 060	309 00
Depreciation of airplanes, parts, etc., exclusive of engines (allowed for under variable costs) 20 per cent of $11 060	2,212.00
Depreciation of tractor and accessories 20 per cent of $2,324	465 00
Depreciation of truck 25 per cent. of $800	200 00
Flying insurance on airplanes including, fire, theft, tornado, crash, public liability and property damage, 20 per cent of $12,660 (quotation from Farrelly and Co)	2,532 00
Fire insurance on club house, hangar, shop, furnishings and equipment, one half of one per cent. on $60 456	302 00
Maintenance of buildings, clubhouse, hangar and shop, three per cent of $33,000 and five per cent of $20 000	1,990 00
Incidental costs due to maintenance of field, about	500 00
Operation of motor truck 7 500 mi at 10c	750 00

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912—

Of AVIATION, published weekly at New York, N. Y., for October 1, 1928.
State of New York, }
County of New York } ss.

Before me a Notary Public in and for the State and county aforesaid, personally appeared R. Sidney Bowen who, having been duly sworn according to law deposes and says that he is the Editor of AVIATION and that the following is, to the best of his knowledge and belief, a true statement of the ownership management etc., of the aforesaid publication for the date shown in the above caption required by the Act of August 24 1912, embodied in section 411 Postal Laws and Regulations printed on the reverse side of this form, to wit:

1 That the names and addresses of the publisher editor, managing editor, and business manager are:
Publisher—Aviation Publishing Corporation 250 West 57th Street, New York, N Y
Editor—Earl D Osborn 250 West 57th Street New York N Y
Managing Editor—R Sidney Bowen Jr., 250 West 57th Street, New York, N Y.
Business Manager—George Newbold, 250 West 57th Street New York, N Y

2. That the owner is:
Aviation Publishing Corporation.... 250 West 57th Street, New York, N Y.
Earl D Osborn.... 250 West 57th Street, New York N Y

3 That the known bondholders, mortgagees and other security holders owning or holding one per cent or more of total amount of bonds, mortgages or other securities are: None

4 That the two paragraphs next above, giving the names of the owners stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

R SIDNEY BOWEN, JR.

Sworn to and subscribed before me this 19th day of September, 1928.
(Seal) HANNAH GOLDENSON
(My commission expires March 30 1930.)

Annual Operating and Maintenance Cost

Operation of tractor, about	$400 00
Rent of gasoline tank and pump	5 00
Telephone service, excluding calls charged to members	300 00
Office supplies and incidentals, about	250 00
Heating of club house and shop, about	750 00
Water light and power, about	370 00
Annual overhaul of four airplanes at $1,000	4,000 00
Allowance for test flying about	300 00
Salary of general manager and instructor	7 000 00
One first class mechanic at $65 per week	3,380 00
One mechanic's helper at $35 per week	1,820 00
Salary of steward and wife (with room and board)	2,100 00
Typist—clerk at $25 per week	1,300 00
Legal and engineer's fees and supervision of accounts, paid by New York office	0 00
Annual audit of books	500 00
Contingencies and miscellaneous, 10 per cent	3,529 00
Total annual operating and maintenance cost	$38,815 00
Variable Flying Costs Per Hour: Gasoline, oil, and grease, about	$3 00
Engine depreciation (basis 500 hr life and cost $1000)	2 00
Allowance for crash losses not covered by insurance	1 50
Engine overhaul every 100 hr at $200	2 00
Contingencies and miscellaneous 10 per cent	85
Total variable charges, hourly	$9.35

Reconciled Balance Sheet

Financing

Investment required		$104 000 00
Membership Enrollment—84 Proprietary Membership shares ($1,000 each)	$84,000	
10 Life Members Fee $500	5 000	
75 Active Members, Fee $200	15 000	$104 000 00

Operating

Annual Operating and Maintenance Cost		$38,815 00
Variable Flying Cost (2000 hrs at 9.35)		18 700 00
		$57,515 00
Annual Income—Dues, Proprietary Members 84 at $150	$12,600	
Dues, Active Members, 75 at $100	7,500	
Hangar rental, with service (5 planes at $30 per mo)	1,800	
2000 hr use of club planes at $15	30,000	
Repairs	2 000	
Profit on sale of gas, oil and accessories	615	
Revenue from 600 hr flying by pilot at $5	3 000	$57,515 00

"It is assumed that the revenue from the dining room, grill, card room, bedrooms, and tennis courts will cover the wages and board of maids, waiters and cooks, and the upkeep of tennis courts," Anson A Bigelow, vice-president of Black and Bigelow, said in commenting upon the report of his firm "All other expenses such as insurance, depreciation, which includes obsolescence, maintenance, light, heat, water, telephone, salaries of the secretary, steward, housekeeper, general manager, and mechanics, have been fully covered in the estimates

"As wide variations occur in the purchase or lease of property, and its preparation as a flying field, no estimates have been made covering such variable investment requirements It is understood, however, that Aviation Country Clubs are covering these costs fully through revenue obtained from initiation fees There will be, of necessity, therefore, variations in the budgets of the various clubs.

"As all fixed expenses applicable to the operation of club planes are set up on an annual basis, and are partially covered by the yearly dues from members, it will be necessary to fix hourly charges for the use of the planes at a figure which will permit a surplus above the hourly variable cost, sufficient to meet the cost of operation of the club less other revenue These variable costs are estimated at $9.35 per hour and, on a basis of 500 hr of flying yearly for each airplane, a charge of $15 an hour without a pilot is recommended in order that the total revenue may balance expenditures For instruction and

taxi service, it is recommended that an additional charge of five dollars an hour be made."

The flying course, offered members attached to the first of the clubs to be established, it is planned will consist of 20 hr instruction and 10 hr solo time The charge will be $550. This is based on the figures evolved by the transport engineering company The instruction, which requires a pilot, is given at a rate of $20 an hour, while the solo time costs but $15 an hour

The formation of other individual flying clubs is discussed in the brochure issued by the national organization Concerning this, the booklet says

"Flying clubs may be organized in any city with a population of 100,000 or over The procedure involves the application to the National Board of Governors by 10 representative citizens of unquestioned social and business standing Their names must be acceptable to the National Admissions Committee, and their application must be passed upon by the National Advisory Committee

"The 10 applicants will comprise a temporary Board of Managers for the flying club They will set up temporary committees, and under a budgeted financial program, compiled and approved by engineers for the club, will proceed with the enrollment of members The National Organization Committee will conduct a membership drive for the local Board of Managers, and will undertake the enrollment of members

"After 50 per cent. of the membership necessary for financing the club has been secured, a meeting of the members is called The permanent Board of Managers, officers, and committees are then elected and appointed, the property for the club is selected, and the improvement program is undertaken The management of the individual flying club, consistent with the constitution, is vested in the Board of Managers"

The organization of the individual clubs in the various parts of the country undoubtedly will have a far reaching effect in increasing interest in aviation as a sport

The Control of the Materials

(*Continued from page* 1185)

The designation of sizes under this plan calls for a further number, the significance of which will depend entirely on the kind of article it refers to The application of size-number to all probable bolts and screws will be quite different from their application to cover sheet and strip steel of all widths and gauges, or pipe and fittings of all types and sizes However, the application of numbers for this purpose has been worked out for all the usual classes of material, and is embodied in a set of tables, such that all the numbers lie in the series from 1 to 999 with none larger. Space precludes showing the whole of even one of these tables here, but a small portion of the Bolt and Screw Table is reproduced below.

STORES NUMBERS FOR BOLTS, SCREWS PINS, RIVETS, ETC

Mach. Sew Sizes		137	163	189	216	268	295	32	374	
Mach Sew Numbers	6	8	10	12	14	16	18	20	24	
Bolt Sizes	1/8		3/16		1/4		5/16		3/8	7/16
Length 1 13/16	89	129	169	225	281	350	419	489	563	619
1 7/8	90	130	170	226	282	351	420	490	564	620
1 15/16	91	131	171	227	283	352	421	491	565	621
2	92	132	172	228	284	353	422	492	566	622
2 1/8	93	133	173	229	285	354	423	493	567	623
2 1/4	94	134	174	230	286	355	424	494	568	624
2 3/8	95	135	175	231	287	356	425	495	569	625

From such a table it is found that the number representing size $\frac{5}{16}$x2 in is No 422. Then the full designation of the bolt in question is "13 HS 23—422"

(*Continued on page* 1224)

There is no usual kind or size of open material, which cannot be given its own definite symbol on this plan. The great advantage of these symbols lies in their briefness and their absolute certainty. Stock room bins must carry labels showing the stock numbers of materials therein. Material specifications must give the stock numbers of materials called for. A blue print of the specification, being used as a material requisition (as described in an earlier article), the identification is complete. An illustration of the use of stock numbers constructed on this plan was shown in the reproduction of a specification, which appeared in two earlier numbers of this series, being those symbols under the heading "Stores Class and Number."

Method for Locating Items Important

We have now considered the means of identifying all items of standard stores. A question of importance, only secondary to that, is the means of locating them in the storeroom. It is not often practicable to arrange them in their bins in strict stock number order. Of course, all bolts will generally be near together, with all screws very likely close by, but the majority of articles must be placed according to size, weight, and convenience of handling, rather than according to stock number. Often too, a small working stock of a given article will be in a convenient bin while a larger reserve stock in bulk, will be carried in a warehouse at a more remote point. Or sometimes there may be two working stocks of the same thing in two departmental storerooms.

For any and all of these reasons there should be a card index of stock arranged by stock numbers, and showing the locations where all items are to be found. The stock bins must therefore be marked according to their location. A plan which has worked well is illustrated in the drawing. Each section is numbered, each bay is lettered, and each shelf is numbered, from the floor up. One bin number then may be 3C5. This is marked on the location index card of the article in question.

While storekeepers soon learn the locations of most of their materials and seldom have need to consult the index, there are nearly always many little used items whose locations are forgotten. Sometimes they are quite lost, or covered up, and unless located, have to be re-purchased to meet a sudden need, although they are in the storeroom all the time.

The location index is indispensable in large storerooms and is very desirable in all.

In the next article, which will appear in an early issue, Mr Douglas considers the forms and uses of the stock ledger and goes on from that to the subject of purchasing.

The Cleveland Airport

(*Continued from page* 1183)

similar flights. For cross-country service, the rates are: Stinson cabin planes, 50 cents per mile; Laird open-cockpit, 40 cents, Curtis OX-5 powered planes, 30 cents.

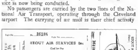
The Stewart Aircraft Co. is one of the newer organizations operating from the Cleveland Airport. It began operation on June 1. Complete new equipment has been provided. Since it began operation, the Stewart Co. has successfully made numerous long passenger flights to New York, Chicago, Detroit, Boston and other large cities. For most of thees trips, Stinson-Detroiter planes are being used. Travel Air machines are being flown also. The aviation school recently opened by the company al-

ready has an enrollment of 23 students A complete course in flying is offered The company also is distributor for Swallow airplanes in the Cleveland district

The officers of the company are Stewart V Kramer, president; Otto I Liesy, vice-president, Theodore E. Griffin, secretary, and E E Basham, sales manager.

The Universal Air Lines recently began to move its equipment to the Cleveland field, and regular flight service is now being conducted.

No passengers are carried by the two lines of the National Air Transport, operating through the Cleveland airport The carrying of air mail is their chief activity



A reproduction of a ticket for one of the aerial tours conducted by Stout Air Services, Inc , from the Cleveland terminal

Two hangars are maintained, one of which supports on its roof a part of the field lighting equipment The Cleveland airport is a stop on the National Air Transport's trans-continental air mail line, and on the night Chicago line

The presence of a large number of competing companies at the Cleveland Airport is one reason for the all around high standard of efficiency, that has been recorded in the past A large proportion of the flying equipment is new but all of it is well kept up Flying rates are much lower than those at smaller fields where competition is not so keen

The Cleveland Airport is operated by the city of Cleveland, as a strictly municipal project. A large area of level ground nearby has been acquired in anticipation of future

Thompson Aeronautical Corp hangar at the Cleveland Municipal Airport

growth At present there, is ample space available for the hangars and equipment for a great many private concerns

A few air line distances from Cleveland to other cities are as follows Toledo, 92 mi , Columbus, 132 Dayton 172 , Erie, 98, New York, 399, Cincinnati, 194; Grand Rapids, 270, Pittsburgh, 125; Louisville, 315; Syracuse, 328, Detroit, 127, Youngstown, 6, Buffalo, 183, Chicago, 324, Wheeling, 112; Akron, 30, Battle Creek, 225, Indianapolis, 270, Milwaukee, 398, Ithaca, 293, and Rochester, 233

SIDE SLIPS

By Robert R Osborn

Mr R H D, Jr, who has just returned from having flown a ship out to the races in Los Angeles, brings a couple of wild tales with him He said he was having some trouble along the way with his aircooled motor and finally at Tucson, Arizona, it wouldn't start at all After working three or four hours in the desert sun, which at midday might register 120 or 130 degrees, in an attempt to find the trouble, a local pilot finally solved the difficulty by explaining that they always had to cool their motors off with a gasoline blow torch before trying to start them Then, later, they found they couldn't climb enough to get over the mountains at all until the ship had been flown back to the last field, so that he and his two passengers could change all of their accumulated silver dollars into paper bills

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We saw the starts of the Trans-Continental races last year from Roosevelt Field, and had hoped to see them again this year, chiefly because we must have missed nearly everything that was going on the first time At least we were looking the other way when most of the items described in the following Chicago "Tribune" article were pulled off Mr R J B of West Lafayette, Ind, sent us the clipping at the time for interpretation—

"The first plane, a Buhl Airster, took off at 7 o'clock, its powerful 220 horsepower Wright Whirlwind pounding a tocsin of time annihilating emprise It was exactly 7 15 when the last plane, a Waco powered by the same Wright Whirlwind, kicked itself free and ascended the same aerial path Each plane had received one minute headway after the first Not a single untoward incident had interrupted the one minute intervals of the crescendo of the starting motors The red flag of the official starter, Captain Walter Bender, fell as rhythmically as yesterday when the twenty-five planes, all class B entries, shot off in perfect rotation"

Mr H W B of Chicago sends in the following clipping taken from the story of an airplane accident in "The World's Greatest Newspaper"

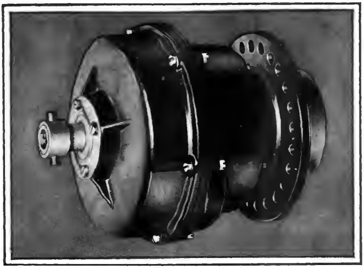
"He flew it for ten minutes Underneath he saw a green pasture, a stretch of farm land Pulling back on the 'stick' he swooped down over the field, and then, without warning, the roar died. The plane was falling, the air shrieking past the struts"

Now in our country, when one pulls back on the stick and swoops down, he takes that to be plenty of warning of what is about to take place

---

Mr "Acon" of New York sends in this note showing how completely air minded the younger generation is getting to be

"Was at the field a short time ago, and while there I noticed two young boys very carefully studying an airplane. 'Ah,' I thought, 'these boys are fully airminded,—they have already learned to know planes forward and backward They have taken aviation for granted and have with their youthful eagerness, mastered its principles' I paused to listen to their discussion . . . 'Say Bill,' said the first, indicating one of the ailerons 'Lookit here—this wing is busted in the back'"



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